Test Center Report: The Best Upgrade Strategies

PC WORLD

SEPTEMBER 1992 $3.95

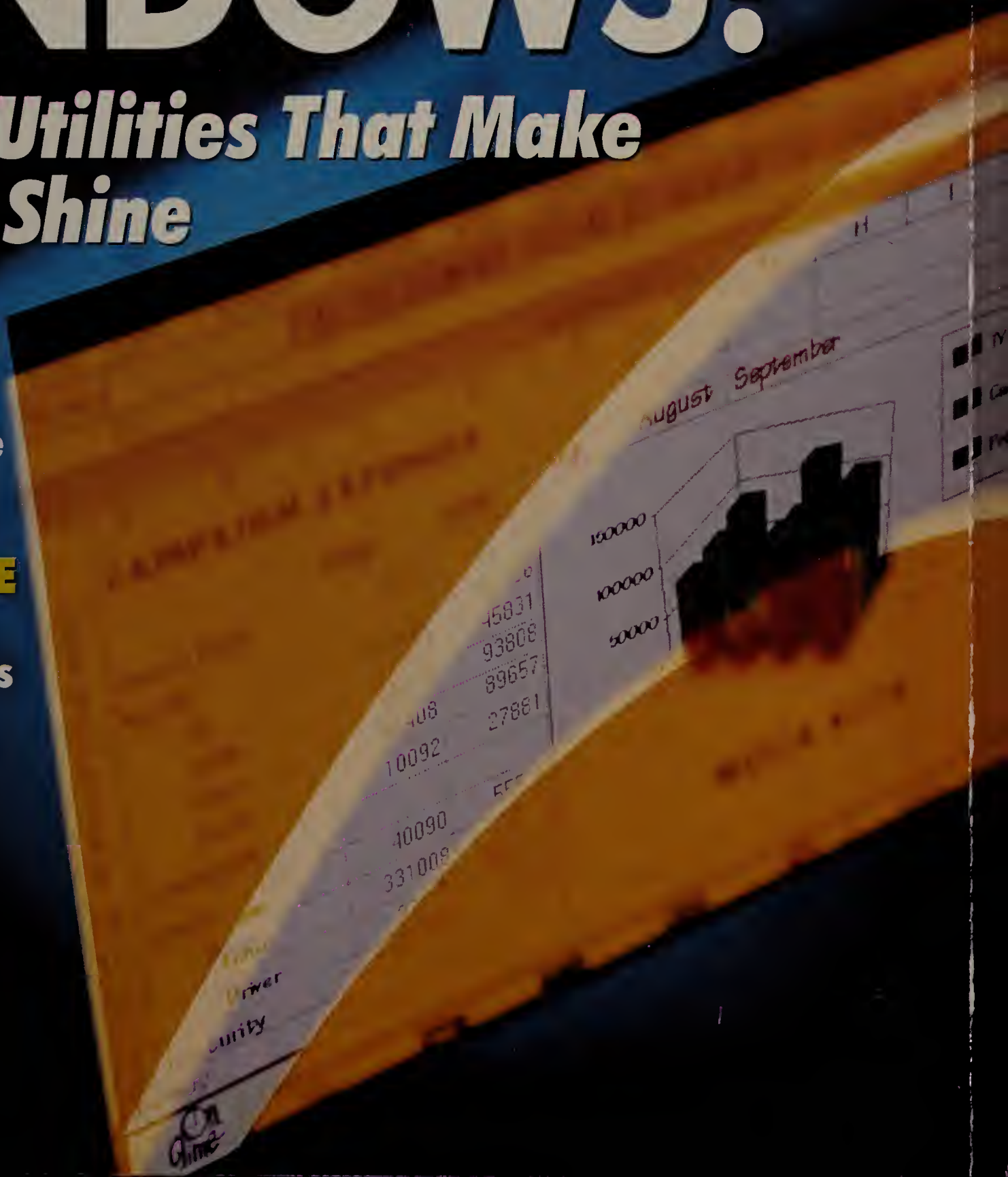
CLEAN UP WINDOWS!

38 Great Utilities That Make Windows Shine

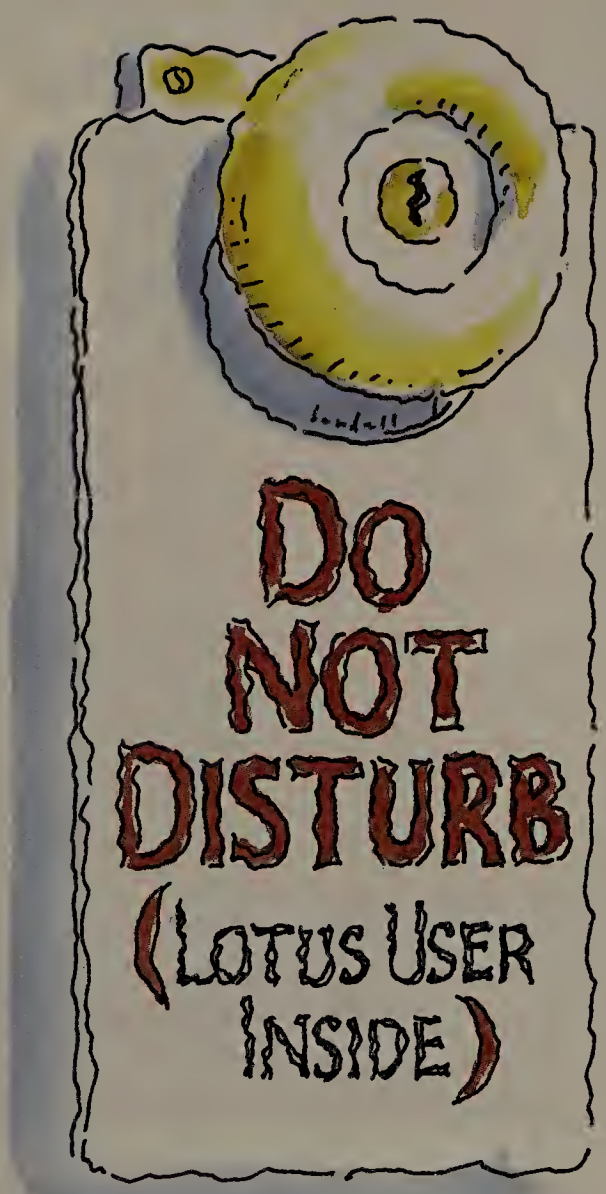
FULL-POWER NOTEBOOKS
24 Hot 386s for the Road or Desktop

125 PORTABLE HARD DISKS
Plug 'n' Play Drives For Every Budget

READ/WRITE OPTICAL!
Carry 120MB in a Shirt Pocket



There is nothing wrong.
Your old spreadsheet
works fine, just fine.
Leave well enough alone.


DO
NOT
DISTURB
(LOTUS USER
INSIDE)

Unless, of course, new Microsoft Excel 4.0 for Windows and promotions and the big bucks and a corner office appeal to you.

The spreadsheet for Windows.

Truth? Okay. We can't guarantee your rise to the top of the corporate ladder. But we can give you a leg up with the fastest, easiest, most powerful spreadsheet known to man.

Introducing Microsoft® Excel 4.0 for Windows.™ It's the spreadsheet that makes your everyday number-crunching tasks, not to mention more complex things, easier than you ever thought possible.

Take the new Autoformat feature: with just a click of your mouse, it applies one of 14 sharp-looking, professionally designed formats to your worksheet.

Autofill is a new feature which intelligently assists you in building your worksheets. For instance, type January in a cell, and Autofill will automatically enter February, March, April–as many (or few) months ahead as you indicate.

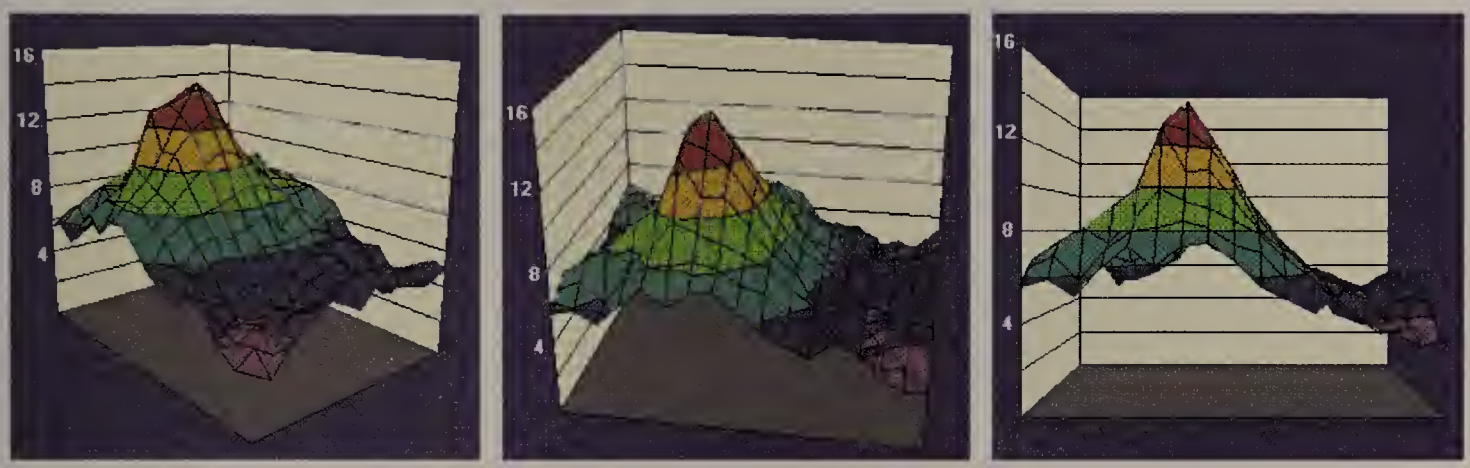
Shortcut menus are another innovation: when you click the right mouse button, a

The Scenario Manager is a powerful analysis tool. In a matter of minutes, you can easily create and save multiple "what if" scenarios, then instantly produce nice-looking summary reports. (Which makes you look nice, too.)

*See reseller for details. **We can only speak for this planet. †Offer good only in the 50 United States. For information only: In Canada, call (800) 563-9048; outside the 50 United States, call (206) 936-8661. © 1992 Microsoft Corporation. All rights reserved.

menu appears on-screen next to whatever you're doing, offering you all the options that sensibly relate to the task at hand.

And Wizards are step-by-step guides that take you through complex tasks, like charting, or creating summary tables from a database.



The gallery of 90 chart types includes rotating 3-D charts, along with surface, radar and picture charts. It looks great here. It's even more impressive on your screen.

With new Drag and Drop, you highlight the area you want to move, "grab" it with your cursor, and drag and drop it to wherever you want it. It's that simple.

We've also made the Toolbar customizable. Plus, it has handy new features like a Spelling Checker and AutoCenter, which lets you center text over multiple columns with one mouse click. Talk about easy.

Invested a lot of time in Lotus®? No problem. You can learn using what you know. Type in your familiar Lotus 1-2-3® commands, and Microsoft Excel shows you the equivalent commands. You can get work done even while you're learning, which makes for a virtually seamless transition.

Microsoft Excel also reads and writes all your Lotus files. And it runs your macros – unmodified.

It even comes with a convenient 90-day money-back guarantee.*

In short, just think of new Microsoft Excel 4.0 for Windows as the ultimate refinement of one-step-power-with-ease.

The upgrade is easy, too. It's $99 for current Microsoft Excel users, and $129 if you're using Lotus 1-2-3 or Borland® Quattro® Pro.† To get a copy of your own, call us at (800) 323-3577, Dept. HB9; or see your local software reseller.

Wondering how to upgrade? Check out the caption underneath the guy on the left – if you're interested in the best spreadsheet on the planet, that is.**

Otherwise, just try to forget you ever saw this.

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SEPTEMBER 1992
VOLUME 10
NUMBER 9

PC WORLD

Improving on Windows: Make Windows 3.1 work just the way you want with these 38 full-fledged shells and simple utilities.

Cover photograph by Robert Cordin

COVER STORY

Clean Up Windows!

Sure, *Windows 3.1* is a huge improvement over *3.0*. But cracks in the interface still surface all too often. Fortunately, a growing collection of shells and utilities aims to make *3.1* a smooth, simple environment to work in. Whether you're looking for slicker file and program managers, drag-and-drop printing, or customized icons and tool bars, new shells and low-cost utilities make *3.1* the polished, powerful interface it's meant to be.

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Windows the Way You Want It 189

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More features at a lower cost than any other notebook.

Period.

The only notebook with a tilt & swivel display. Great for sharing data or keeping it private. Easily adjusts for perfect viewing.

This fine Italian leather carrying case is an additional option. Loaded with pockets and features everyone will appreciate.

Digital brightness and contrast buttons make screen adjustment so easy.

ZEOS® Freestyle/SL 2MB, 60MB Only $1895

To try and compare the new ZEOS Freestyle/SL to any other notebook on the market is next to impossible. Because nothing else has all its features. And even with all these great features, nobody can match the price. Features and price. It would seem the new ZEOS Freestyle/SL is the best of all worlds. It is.

DESIGNED BY USERS. JUST LIKE YOU!

We asked our customers what it is they want in the perfect notebook. The first thing they told us is that most notebooks look like a cigar box with a lid. They told us they wanted not only good looks, but things like great power *and* great battery life. Lightweight too, like five pounds and change. And the keyboard should be effortless to use. The entire product had to be extremely durable. And that was just for starters.

SL POWER. SL BATTERY LIFE. 64K CACHE!

We listened well. Then we got down to work. For the chipset and CPU we selected the Intel 25MHz SL. We then built in a high-speed 64K SRAM cache as standard. We know this system might well replace a desktop for many users.

PC Magazine said the SL chipset is "the way to go" and we agree. The ZEOS Freestyle/SL incorporates the very latest in power-saving features. You can easily go in and out of the various power-saving modes automatically as well as use our "Windows Safe" suspend/resume feature.

And power to your ZEOS Freestyle/SL system is provided by our advanced battery system. The fully enclosed lightweight battery packs easily snap in and out and can be "quick-charged" when the system is not being used or trickle-charged when in use. So what happens when the power is on?

GREAT VIDEO TOO.

You get great video! Because for video control, we chose the amazing new Cirrus Logic VGA controller. Also made especially for notebooks, it not only consumes less power, it also produces the fast crisp images you're looking for. And with a business machine like this you'll also appreciate our dual display capabilities. You can connect an external VGA color monitor for simultaneous co-display. And that's not all.

A NOTEBOOK KEYBOARD YOU'RE GOING TO LOVE.

Can't someone design a notebook keyboard to be like a desktop keyboard? And while you're at it, be sure to include a pointing device that's easy to use, with three click keys. And how about making sure those cursor keys are *full size* and in the inverted-T format. And all the keys should have good travel and that "just right" ergonomic feel. That was the keyboard wish list.

So we re-designed and re-sculpted every key from scratch. Even the key-switch mechanism was invented anew. And we added the mouse key for easy cursor control. It is the absolute perfect notebook keyboard. What else?

Lots else! Like the best display system of any notebook available anywhere. We listened here, too. The screen is big and easy to read. Plus, it's high-contrast and it's fast. It's also very easy to adjust. People said contrast and brightness knobs were hard to use. So we replaced them with soft touch buttons that *electronically* adjust screen settings at your command. Then we really got creative.

THE ONLY NOTEBOOK WITH A TILT & SWIVEL DISPLAY.

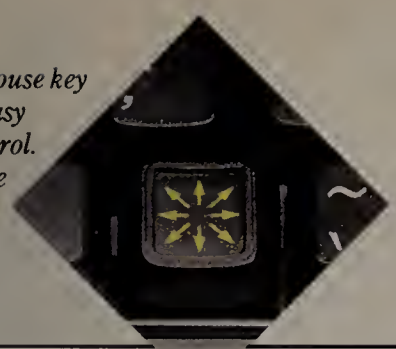
Your new ZEOS Freestyle/SL is the only notebook in the world with a screen that tilts, swivels and floats!

Can you imagine your desktop PC without a tilt and swivel display? Neither could we. So why not incorporate that feature into a notebook. With the ZEOS Freestyle/SL notebook you can adjust the screen left and right as well as up and down. Now you can truly adjust your notebook screen to the perfect viewing angle.

This comes in handy in other ways as well. It's easy to share data with a person sitting next to you by turning the screen; or if privacy is in order, turn it away so only you can see it. Every frequent flier will appreciate that!

Circle 258 on reader service card

Built-in mouse key provides easy cursor control. Leave those bulky mice behind!



This sliding port door won't break off or come loose. Saves your fingers, too.

IT FLOATS TOO!

And then there is the "floating" screen. When you're facing your new ZEOS Freestyle/SL, the screen actually appears to "float" in the air in front of you. It's the only notebook that can really be used sitting on your lap! Back to our frequent fliers. Because the screen floats on a smaller footprint than normally hinged screens, you can also use the ZEOS Freestyle/SL without fear of the person in front of you cranking their seat back and doing a "screen crunch" on your system.

EXTRA, EXTRA, EXTRAS. READ ALL ABOUT 'EM!

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Ordering your new ZEOS notebook is easy. Simply pick up the phone and give us a call. A friendly ZEOS Systems Consultant is ready to answer any questions you may have. You're going to love your new ZEOS notebook. Give us a call!

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Info World June 22, 1992

We've taken the power and advanced 32-bit upgrade technology of our award winning desktop systems and condensed them into a lightweight portable PC. The Ranger M486 Series is the first notebook PC to offer a 32-bit modular upgrade path to full 25-MHz i486DX processing

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AND THE

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Circle 9 on reader service card

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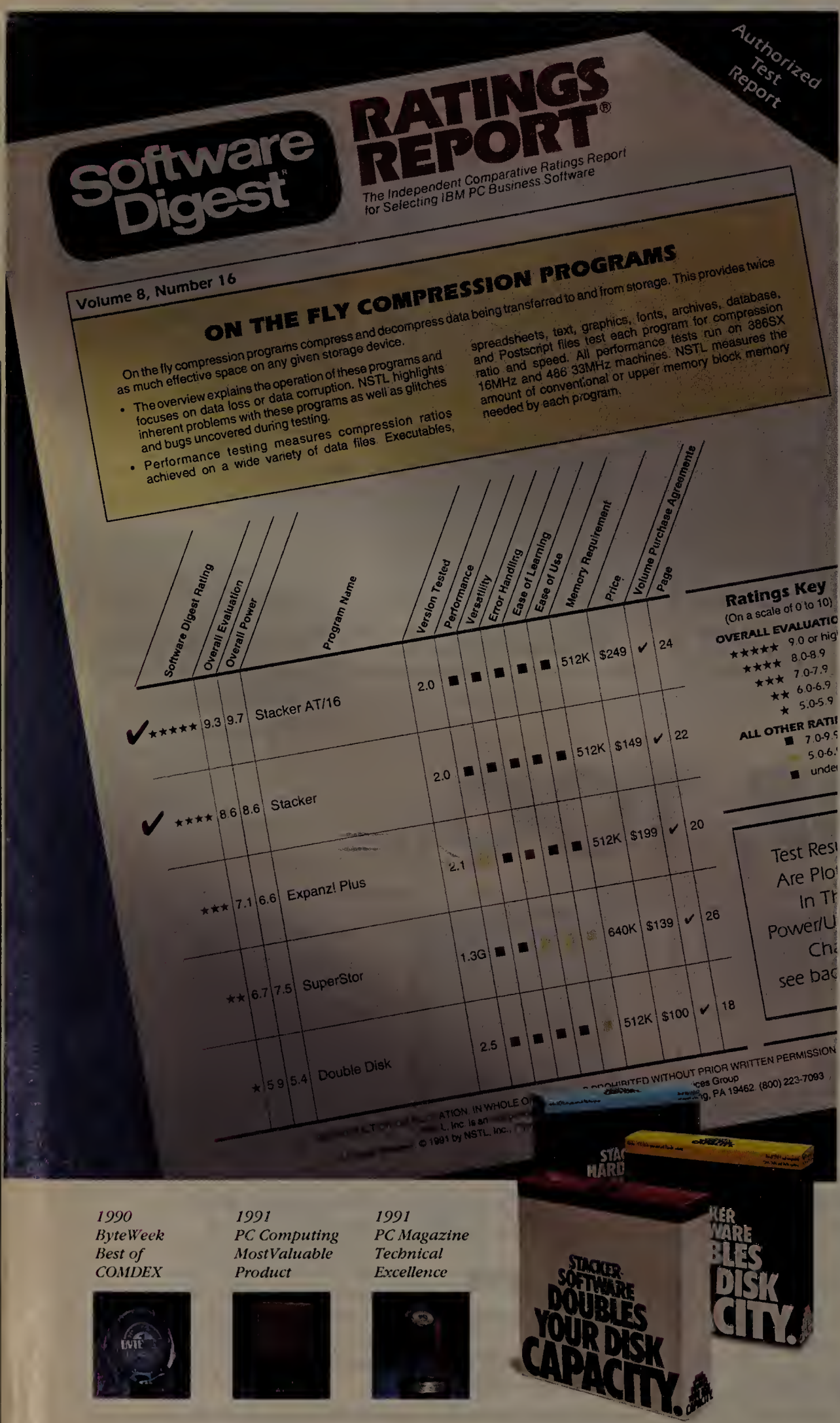

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Circle 271 on reader service card

The Great Windows Make-Over

The more people who try *Windows*, the more complaints we seem to get. A typical letter goes like this: "You are undoubtedly in the pay of Microsoft. How can you even compare *Windows* with (pick one: good old DOS, *Desqview*, GeoWorks, UNIX, OS/2)? Have you ever used *Windows?*"

To settle the score, the answer is yes, the editors at *PC World* use *Windows*. Not all of us are enchanted by it; many (including me) revert to a favorite DOS application when we get sick of waiting for the screen to refresh. But those who find *Windows'* interface too clunky have done more than complain—we've chosen utilities that make managing files and applications easier.

Fortunately there are plenty of *Windows* fixers to choose from. As the authors of this month's pair of articles on *Windows* utilities can attest, an entire industry has emerged that creates software to tailor *Windows* just the way you like it. Contributing editors Robert Luhn and Daniel Tynan together cover no fewer than 38 packages proffering everything from major face-lifts to patchwork, pop-up menus.

We asked Luhn to test-drive the *Windows* shells—packages that replace both File Manager and Program Manager. A former senior editor for *PC World* (and one of the few humans brave enough to boot up the first shipping version of *Windows* back in 1985), Luhn was assigned a big comparative review. After some preliminary testing, however, Luhn felt that, by press time, only two programs were fully compatible with version 3.1: Hewlett-Packard's *NewWave* and *Norton Desktop for Windows*. Hence "The Windows Shell Game," this month's spirited shoot-out between the two packages.

Luhn plowed through installing, configuring, and informally testing the compatibility of both products. As Luhn notes, *Norton Desktop for Windows* extends the *Windows* paradigm, while *NewWave* sets out to do something much more ambitious—it attempts to reinvent *Windows*. *NewWave* does its best to eliminate the clunky load-app, load-file metaphor, offering document objects that load themselves instead. A great idea—and one that can work in companies where an in-house developer has the time to set up turnkey configurations using complicated *NewWave* scripts. What's the verdict for end users who want to set up *NewWave* themselves? Turn to Luhn's article on page 168 to find out.

Some may question whether either *Norton* or *NewWave* is worth the performance penalty—not to mention the 7MB to 9MB of disk space. Many users prefer less ambitious programs that clean up one or two glaring problems and are content to wait for *Windows 4.0* to do the rest.

That's where Daniel Tynan's article, "Windows the Way You Want It," comes in. Tynan collected over 60 programs and selected the top 30, neatly dividing his favorites into several categories: icon and cursor tools, desktop extenders, file managers, program launchers, and so on. The experience, which he says "literally made me dream of icons," put Tynan in an excellent position to advise people who want to smooth *Windows'* rough edges.

First, says Tynan, "isolate what you want to fix—say, replacing File Manager. Then look for something that suits your work style." For example, Tynan doesn't like to keep lots of windows open at once, so desktop extenders (which give you a "virtual screen" several times larger than your monitor's) are not his cup of tea.

Daniel Tynan and Robert Luhn, the two contributing editors behind this month's guides to Windows utilities.

ROBERT CARDIN

What are his favorites? "*Squeegee* does everything for me," says Tynan. "When you activate it, it reads all your program groups and creates a pop-up menu you can access within any application. Anything that minimizes switching between windows saves me time." A similar program, *Metz Task Manager*, is a close second.

But that's just one writer's opinion. Another favorite utility around the office is *hDC Power Launcher*, a multimodule package that uses a tool bar to provide access to enhanced DOS commands, custom launch menus, and so on. When it comes to choosing a *Windows* fixer, taste is everything—so check out this month's guides to *Windows* fixers, and choose for yourself.

Eric Knorr

ERIC KNORR
EDITOR

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If you're looking for a better way to work in Windows, SmartSuite™ from Lotus® is one smart choice. Because not only does this suite of four award-winning Windows products offer you an incredible value for your money. It also delivers individually outstanding products that work together. Each shares a common interface. As well as common features like our unique SmartIcons™ for one-click access to the tasks you perform most frequently. Which means the products work so much alike that when you learn one you've learned them all.

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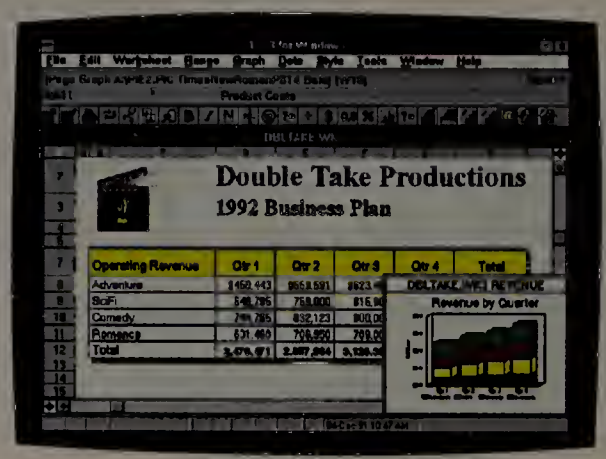

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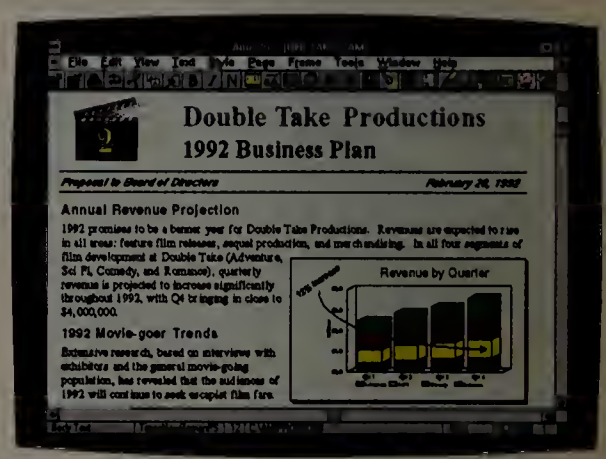

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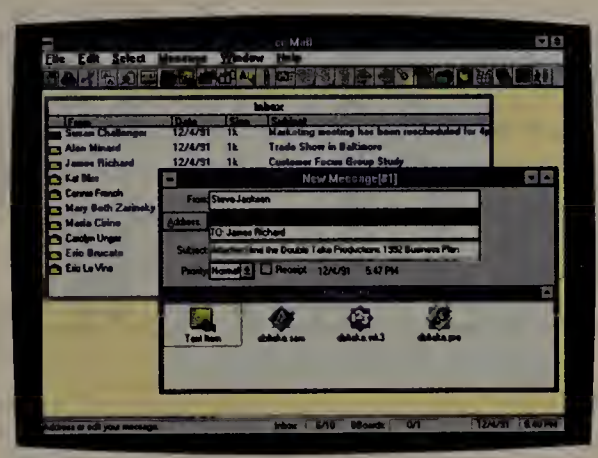

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"When the earthquake hit, I watched helplessly as my poor LaserJet went crashing to the floor."

—James Cost, Chief of Police, Campbell, CA

"The LaserJet fell from about four feet," said Police Chief James Cost, recalling the disastrous San Francisco earthquake. "I assumed we'd have to buy another one. But later, my secretary plugged it in and printed a document. It's about the only thing that did work that day."

Reliability is only one of many reasons more people use HP LaserJet printers than all other laser printers combined. Some people cite innovations like Resolution Enhancement technology, which creates sharper edges and better overall print quality. Or genuine PCL5 printer language. Or the range of options, with five printers priced from $1,249 to $5,495.*

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LETTERS

Reactions and responses from the PC World community

Small Fish Among the Sharks

As the owner of a small mail-order computer company, I'm upset by the recent hoopla about mail-order fraud. I agree that any vendor who steals from consumers deserves retribution, but the few are spoiling it for the many. Moreover, recent guidelines for buying mail order in computer magazines advise consumers to buy from dealers who run big ads, proving they can afford to ship what they're selling. This attitude hurts small fish like me. Small businesses simply don't have the funds to advertise on a large scale. This doesn't mean we sell junk or provide bad service. If consumers want to check us out, we have nothing to hide. They should do what you advise in "Consumer Watch Special Report: Scam!" in May. Call the postmaster in our towns, the Better Business Bureau, and the Chamber of Commerce. Don't shun small businesses. You may be surprised at the great price and excellent service you get and still have money in your pocket.

MARCIA STIEGER

JIM NICHOLSON
POWERHOUSE COMPUTERS, INTERNATIONAL
ELIZABETHTOWN, PENNSYLVANIA

Why Not Buy It Here?

In "Scam!" in the May issue, you listed ten tips for buying direct. Tip number three told consumers to evaluate products at their local computer store before ordering. I'm a retail store owner, and this upsets me. Recently I spent hours loading and demonstrating an accounting system to a prospective customer. This customer borrowed my manual for several days to ascertain if the package would do what he wanted. When he returned it, he thanked me and said that he had ordered the software through the mail to save a few dollars.

I know this behavior occurs frequently, but I don't believe your magazine should promote it. A sale every now and then helps the retailer offset the cost of operating a free-advice business.

JIM LOWE
COMPUTER CARE
MORGANTON, NORTH CAROLINA

New Fish in the Big Blue Sea

Congratulations on "OS/2 2.0 Challenges Windows 3.1" in June. That's the first time I've seen *PC World* explore such a controversial issue concerning us power users.

I'm neither a Big Blue fan nor a Microsoft basher, but the potential benefits of a 32-bit system are so obvious that OS/2 cannot be overlooked. With the standardization of the EISA architecture, coupled with a reduction in the cost of these machines, it won't be very long before the average user will be able to afford powerful machines that have 32-bit processors and a 32-bit bus.

ROGER L. CARTEE
IDAHO FALLS, IDAHO

Into the Twenty-First Century

The past couple of issues of *PC World* contain articles extolling the virtues of spreadsheets. My vote of appreciation for a spreadsheet will go to the first one that will allow me to use the @DATE(YY,MM,DD) function for dates beyond December 1, 1999. Until then, my boos will contribute to the confusion of your applause meter.

I have attempted to insert a list of dates in the year 2000 into *1-2-3 for Windows, Quattro Pro 4.0, Excel for Windows 3.0,* and numerous other spreadsheets over the years, with the universal result that every one has failed to give reliable dates into the twenty-first century.

It is my contention that any spreadsheet that we buy in the 1990s should be able to project dates into the 2000s.

A. E. DOUGHTY
EDMONTON, ALBERTA, CANADA

The Home Office

I am a loyal reader of *PC World.* Having recently started a business at home, I find *The Home Office* by Steve Bass helpful and informative, with a touch of humor to make it entertaining. Thank you from the bottom of my CPU.

SUSAN SCHESNOL
DEERFIELD, ILLINOIS

Printer Gets a Rough Ride

I take issue with the rough ride received by my favorite color printer—a Tektronix—in "Color Printers Come Through" in May. While I don't doubt that the HP printer does a very good job, I find it deficient when printing large sheets and rolls of paper.

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I love our Tektronix printer. It prints very ably on letter- and legal-size paper and handles 11-by-17-inch sheets and 11-inch wide rolls with equal aplomb. Admittedly, the resolution is only 216 by 216 dpi. But when we purchased our printer two years ago, 300-dpi color came only in thermal wax implementations at prices exceeding $10,000.

JAMES MCLEAN
VIA COMPUSERVE

We agree Tektronix makes some excellent printers. However, we didn't feel the ColorQuick was up to the firm's usual high standards. —Dan Miller

9600-Baud Modems?

You blew it thrice in June—on the cover, in the *New Products* item "Intel Drives Down the Cost of Fax," and in "Buyers' Guide: High-Speed Modems." The problem? The terms *baud* and *bps* [bits per second] are definitely not interchangeable. You can interchange these terms in the 0-baud to 300-baud speed range. Beyond that, no. You cannot say that 1200 baud is the same as 1200 bps. For example, the Hayes Smartmodem 1200 operates at 600 baud and uses a technique known as QPSK to achieve 1200 bps by transmitting 2 bits of information with each change in the state of the line.

MIROSLAV E. VESELEY
LOWELL, MASSACHUSETTS

Spreadsheet Tips

I was thrilled to find "50 Spreadsheet Tips" in June. It's full of hints that I had fun trying out. In particular I was excited by Tip 35, "Double-Click Best Fit," for *Excel 3.0*. If I add up how much time this tip saves me, I can rationalize taking a longer lunch break. Thank you!

LESTER STEERS
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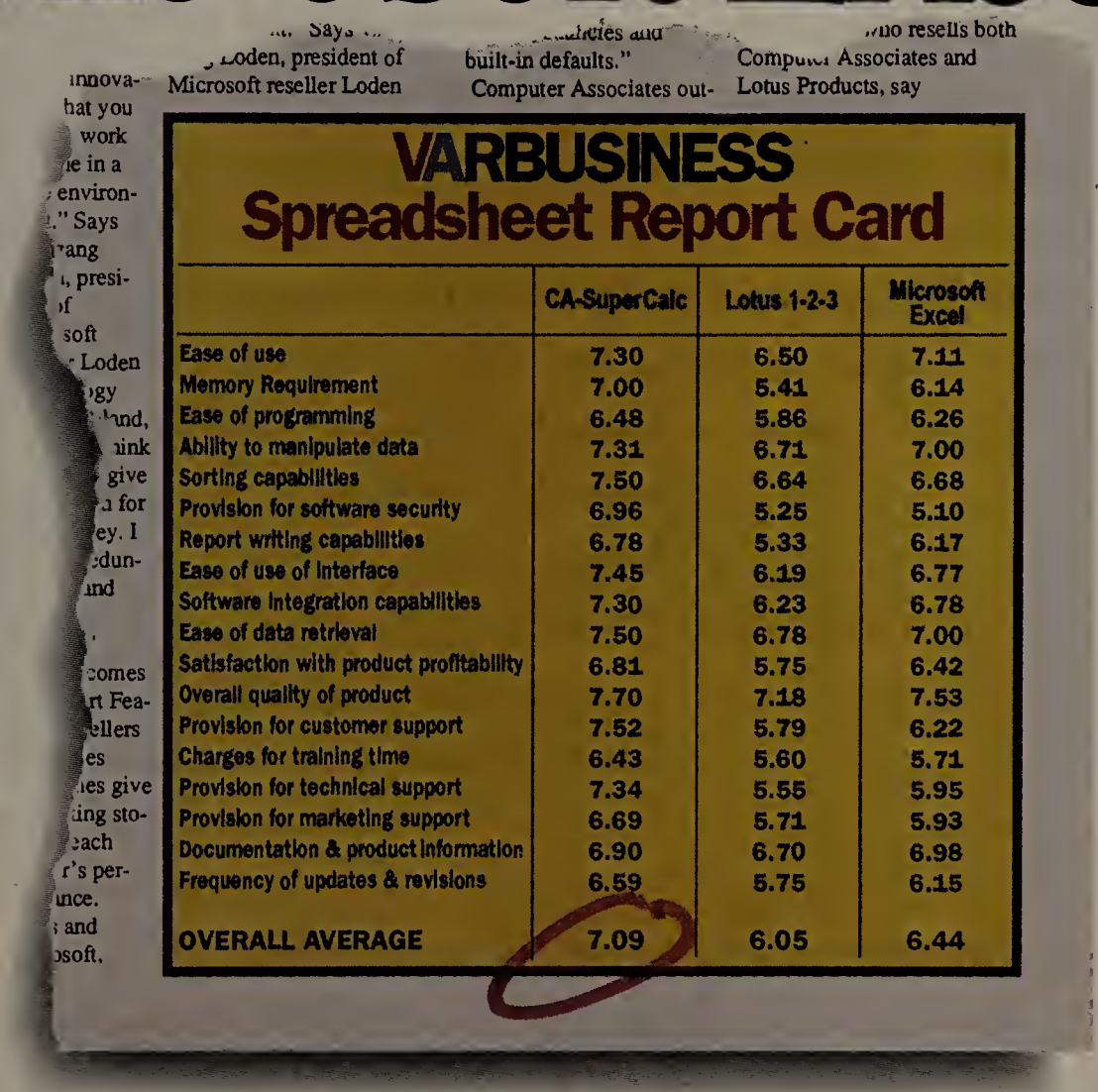
Sue the Competition

Years ago when Intel was pushing their 8088, NEC gave them some serious competition with a V20 CPU. The NEC chip ran faster and cooler and

The Pros Rate CA-SuperCalc Higher Than Lotus 1-2-3 And Microsoft Excel.



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Sorting capabilities	7.50	6.64	6.68
Provision for software security	6.96	5.25	5.10
Report writing capabilities	6.78	5.33	6.17
Ease of use of interface	7.45	6.19	6.77
Software integration capabilities	7.30	6.23	6.78
Ease of data retrieval	7.50	6.78	7.00
Satisfaction with product profitability	6.81	5.75	6.42
Overall quality of product	7.70	7.18	7.53
Provision for customer support	7.52	5.79	6.22
Charges for training time	6.43	5.60	5.71
Provision for technical support	7.34	5.55	5.95
Provision for marketing support	6.69	5.71	5.93
Documentation & product information	6.90	6.70	6.98
Frequency of updates & revisions	6.59	5.75	6.15
OVERALL AVERAGE	7.09	6.05	6.44

Recently, *VARBUSINESS* conducted a survey of some people who know more about spreadsheets than anyone.

The people who sell, install, and support them for a living. The survey asked hundreds of spreadsheet dealers and resellers all kinds of questions to find out what the pros rate as the best spreadsheet. And the pros told them.

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In virtually every category from ease-of-use to technical support, CA-SuperCalc was rated higher than Lotus® 1-2-3® and Microsoft® Excel.

We're not surprised. While Lotus and Microsoft have been fussing over their many different spreadsheet versions, we've been stuffing one spreadsheet, CA-SuperCalc, with everything you would ever want. From spreadsheet linking to 3-D graphics and beautiful, presentation-quality output, CA-SuperCalc has it all.

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But the best part is the price. At $149.00, CA-SuperCalc costs less than half the price of Lotus 1-2-3 and Excel. Heard enough? Call 1-800-CALL CAI today for the name of the nearest dealer where you can buy the best spreadsheet there is.

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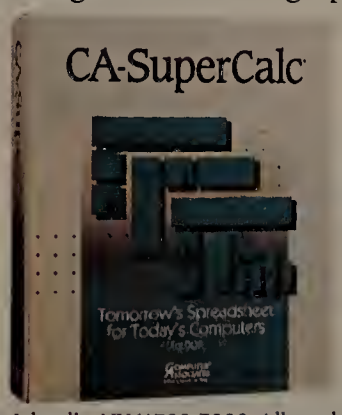
CA's Computing Architecture For The 90s.



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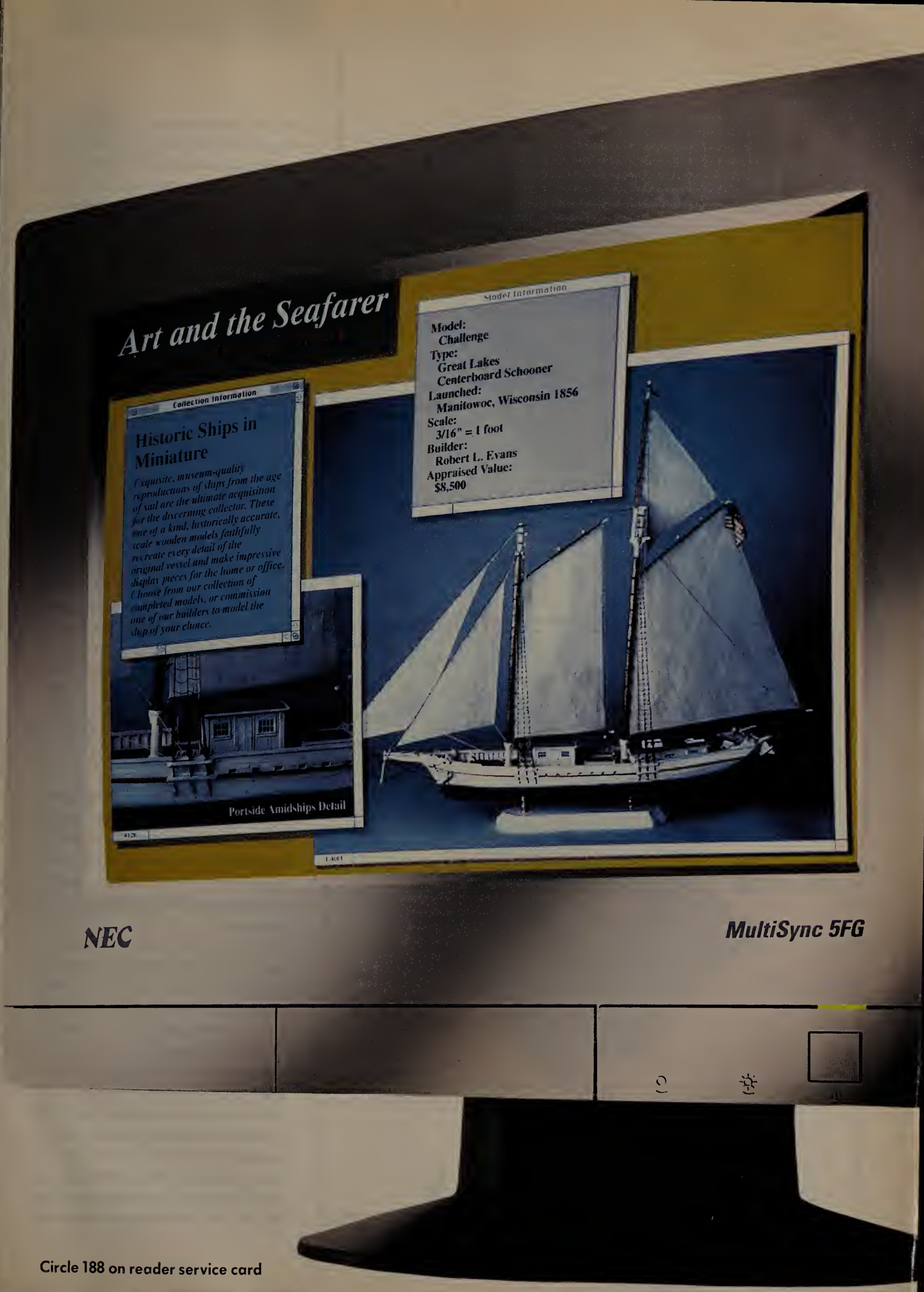

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had better-engineered microcode. So what did Intel do about it? Did they respond by improving their 8088? No. They sued.

Then came Intel's 80286. As usual it ran hot and slow, at least compared with Harris and AMD 286 chips. But Intel didn't improve their 286. Instead, they jumped to a 386 design, which was supposedly proprietary. However, it seems they were in such a rush to monopolize the free-enterprise system, they didn't have time to do it right. Now you can get a faster, cooler 386 from AMD. Did Intel improve their 386? No! They sued! Thanks to our court system, they failed (both to improve their 386 and to stop AMD).

It seems that Intel's marketing department is run by some rejects from Detroit (whose mentality took America's automotive business from its position as world leader to struggling entity). If Intel marketing personnel would spend more time understanding their lab operations and quality control than their lawyers' lobby, it would improve matters for all of us.

PRESTON PETTY
CAMARILLO, CALIFORNIA

Compaq's Hot Commodity

PC World is one of the best publications in the business, and we at Compaq appreciate how difficult it is to keep abreast of PC pricing. But someone was asleep while researching prices for "33-MHz 486s: Hot Commodities" in the June issue.

The January list price for the Compaq Deskpro 486/33M was correctly given in the article as $8196. But the March list price dropped to $5446, not $6245 as you reported. That's an important $800 difference.

Moreover, that Compaq Deskpro 486/33 configuration now costs less than $4200, and a similar configuration of the Compaq ProLinea is available for less than $2800.

We hope that when readers pull out their June issue to comparison shop, they will consider the aggressive pric-

ing from Compaq as well as the traditional Compaq quality. If they have questions, they can call our Customer Support Center at 800/345-1518.

JOHN SWENEY
MEDIA RELATIONS PROGRAM MANAGER
COMPAQ COMPUTER CORPORATION
HOUSTON, TEXAS

All of the other systems in PC World's *review were priced with 1024 by 768 video. The minimum standard configuration, however, was standard VGA. The late street price for the Compaq system should have been reported with a standard video board and a $449 14-inch 640 by 480 Video Graphics Color Monitor. The price we reported in error included a QVision 1024/E (EISA) Controller and a 15-inch QVision 150 Monitor. These options list at $1348, with credit given for the standard 800 by 600 Advanced Video Graphics board. We apologize for this error. —Ed.*

Corrections and Clarifications

The Features Evaluation in "Memory Managers" in the July issue incorrectly designates Novell's DR DOS 6.0 as a Best Buy. Qualitas's *386Max 6.01* and Quarterdeck's *QEMM-386 6.02* are the Best Buys.

The July preview "CorelDraw Grabs the Lead" erroneously indicated that *Adobe Type Manager* is bundled with *CorelDraw 3.0*. While the CD ROM bundled with *CorelDraw* includes more than 250 fonts in Adobe Type 1 format, *Adobe Type Manager* is not included. In addition, the CorelShow presentation module does not support video. *PC World* regrets the errors.

Mail your reactions, responses, and ideas to Letters, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Letters; CompuServe, 74055, 412; MCI Mail, PC World Editorial; or 415/442-1891 (fax). Include your name, city, state, and phone number. We reserve the right to edit letters.*

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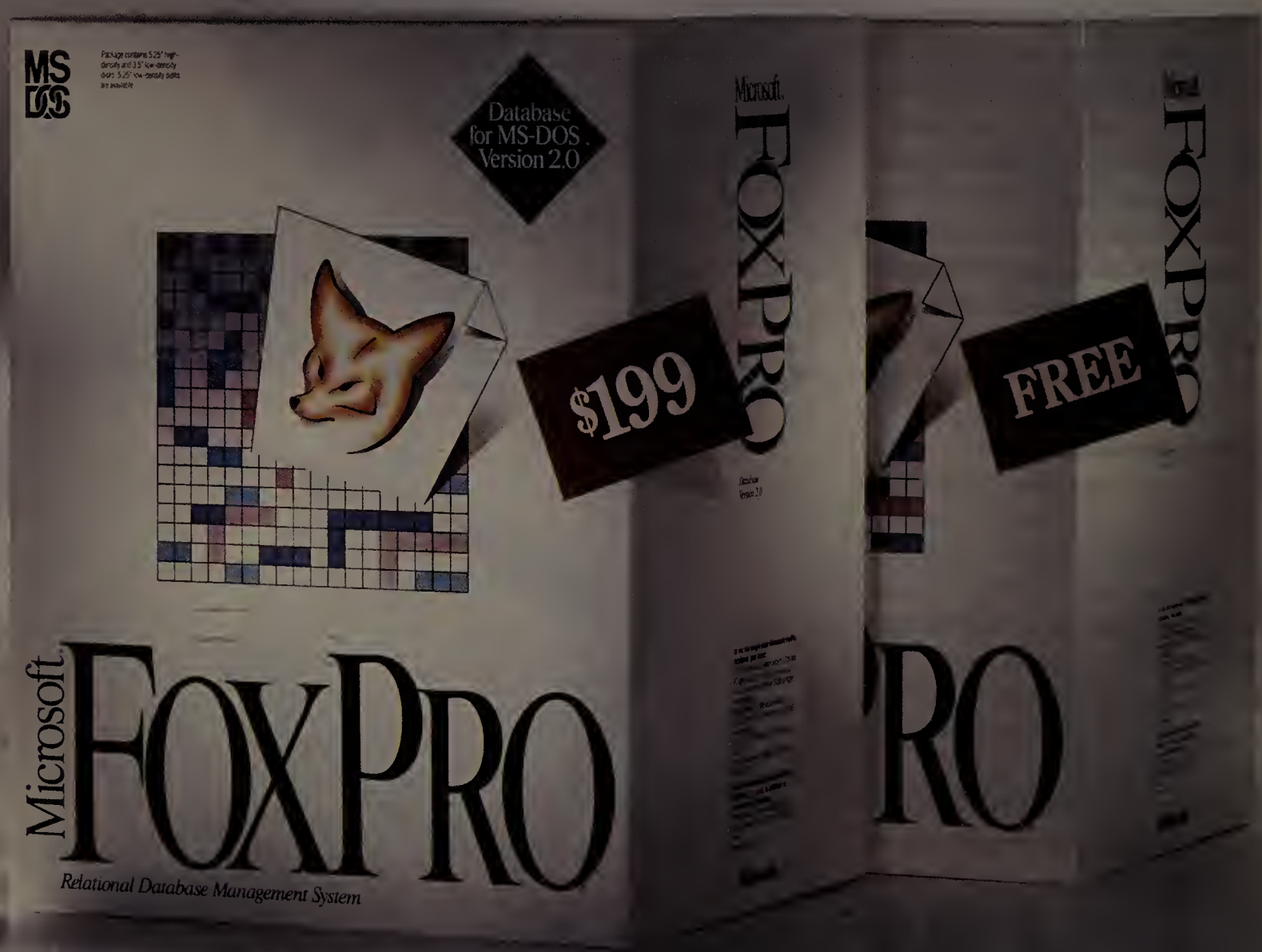

And an offer that won't.

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Direct Access searches your disk, gathers your programs into logical groups and builds menu screens just like the one you see at the top of this page.

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That's right. You just load it and forget it.

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The more applications you have on your disk, the more you'll delight in Direct Access.

That's because Program Manager insists on grouping your programs into five arbitrary categories: "Windows Applications," "Non-Windows Applications," "Accessories," "Games" and "Main."

Not very intuitive, eh?

Direct Access, on the other hand, gives you a multitude of utterly sensible program groupings – 17 of them.

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What does all this mean to you?

It means you can get to a spreadsheet by simply clicking "Spreadsheet." Summon a word processor by stroking "W." And access a DBMS by selecting, you guessed it, "Database."

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If the only PC you're responsible for is the one on your desk, Direct Access is valuable, indeed.

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CONSUMER WATCH

BY ROBERTA FURGER

Advice and information for the computer consumer

PCs and Politics

From voters poring over a candidate's position papers to residents monitoring local city council activities, thousands of people throughout the United States are using computers to become better informed and take a more active role in the political process.

Starting with a few cities in the late 1980s, community bulletin board services (public systems with information on a wide range of local and national topics) have sprung up in dozens of cities throughout the country. Some of the systems were initiated and are managed by government staff. Others are the by-product of grass roots movements. At least one state, Hawaii, has also established a program for residents to obtain information about everything from the status of bills pending in the state legislature to how to contact their representatives—simply by using a PC and modem or a dedicated public terminal.

The Public Electronic Network (PEN) project, started in 1989 in Santa Monica, California, was the first interactive BBS of its type. Besides information about city commissions, councils, and agencies, the PEN project has an electronic-mail component and features 15 conferences (similar to CompuServe forums), where residents can discuss city issues such as rent control, growth and development, and homelessness, plus a wide variety of leisure topics .

Although many of the regular PEN users were already involved in local politics, the project has brought new people into the process. "A number of people we've run across could not participate in politics without PEN because of time constraints with children or other duties," says William Dutton, professor of communications and public administration at the University of Southern California's Annenberg School for Communication. Students, too, have found a voice on PEN.

PEN has done something more—it's brought a disenfranchised group into the system: the city's homeless population. Twenty public terminals have been placed in schools, libraries, and recreation centers throughout the city, so people need not own a computer to participate. Roughly 20 percent of the people logging on to the system do so through the public terminals.

The PEN project is only one of dozens of systems throughout the country. Glendale, California, in Los Angeles County, is getting ready to go on line with a system that will include dial-up access from personal computers as well as from numerous multimedia kiosks throughout the city, where residents can access the full range of services.

Besides carrying agendas and minutes for all the meetings of the city council and other boards, the system will include multimedia presentations on each of the council members, featuring a series of questions and answers on issues pertaining to city government. "At the touch of a button, someone can send E-mail to the mayor right after listening to his words on a particular

BUG WATCH

Up-to-date information about hardware and software bugs

Lap-Link Pro 4.0 and the Intel SatisFaxtion Board

Lap-Link Pro 4.0 is incompatible with the Intel SatisFaxtion board. When *Lap-Link Pro 4.0* tries to initialize the modem, the software delivers the error message 'Modem Initialization Failure'. Traveling Software, the maker of *Lap-Link Pro,* is working on a fix, which will be made available to registered users free of charge.
Traveling Software
206/483-8088

Excel 4.0 and cc:Mail for Windows

If you're running *cc:Mail for Windows* and load *Excel 4.0,* you won't be able to open an *Excel* file or print from within a spreadsheet. According to Microsoft, *cc:Mail for Windows* loads an older version of the COMMDLG-.DLL (common dialog) file than is used by *Excel 4.0* (and *Windows 3.1*). When you initiate *cc:Mail,* the software looks to see if a copy of COMMDLG.DLL is loaded. If a copy isn't found, *cc:Mail* loads its own copy. That's why this problem crops up only if you load *cc:Mail for Windows* before *Excel 4.0.* You can fix the problem by deleting COMMDLG.DLL from the *cc:Mail* directory so that *Excel 4.0* uses its own version of the file. *cc:Mail for Windows* knows to look in the *Windows* directory for this file, so deleting it won't affect your ability to run E-mail. The *cc:Mail for Windows* COMMDLG.DLL file is probably on a network drive. Be sure to back up the file before you delete it.
Microsoft
206/635-7070
—*Christina Wood*

Have you run into a software bug or hardware incompatibility? Call us at 415/978-3253 with the details. We'll investigate problems and report on those with broadest interest.

Christina Wood is an assistant editor for PC World.

ANTHONY RUSSO

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European Offices: England Tel 0860 81 5511 Fax (44) 442 236540; France Tel 05 90 65 09 Fax (33) 1 39 63 31 20; Germany Tel 01 80 81 3685, Ireland Tel (353) 61 475609, Fax (353) 61 475608; Switzerland Tel (41) 22 341 26 50 Fax (41) 22 341 06 82; Belgium Tel 078 111292; Netherlands Tel 06 0222065. © 1992 Pacific Data Products, Inc.

topic," says Mike Anderson, staff consultant for the city of Glendale and one of the program's developers.

In addition to the self-contained systems such as those in Santa Monica and Glendale, an entire network of community bulletin boards has sprung up throughout the Midwest and in cities elsewhere in the United States. They are based on a concept developed by Tom Grundner, a professor at Case Western Reserve University in Cleveland and founder of the Cleveland Free-Net Community Computer System.

One of the driving forces behind Cleveland Free-Net is a concept Grundner calls "teledemocracy"—using telecommunications to disseminate information about city, county, state, and national government to inform the electorate. In 1990 when Ohioans were embroiled in a hotly contested gubernatorial race, Cleveland Free-Net posted the full text of all the position papers put out by both major candidates. The information was so widely read that Grundner broadened the data base to include similar information released by every candidate for every office in the state of Ohio.

During this presidential election year, Grundner has arranged with all three major candidates to post the full text of every position paper and press release issued by the Bush, Clinton, and Perot campaigns. This information will be available to Free-Net users as well as to users on any of the affiliated networks, which now total nearly two dozen, in such cities as Los Angeles, Washington, D.C., and Peoria, Illinois.

"We'll then run bulletin boards where people can participate in debates on the positions taken by the candidates," adds Grundner. And because all the Free-Net systems are linked, he says, a message posted in L.A. "will be echoed in Peoria and Youngstown. It'll be like a national town meeting based on the full text of what the candidates actually have to say.

"I don't know what the ultimate effect will be, but as far as I'm concerned, democracy is strengthened anytime access to information is increased."

BBS Resource Guide

Interested in logging on to one of the community bulletin boards discussed here or setting one up? Contact the following offices for information.

- **Hawaii FYI**
Statewide BBS that includes full access to legislative information. 808/586-4636
- **LNX Project**
Glendale, California, community BBS. 213/939-4245
- **National Public Telecomputing Network**
Not-for-profit organization established to assist in the development of community BBS's, such as Cleveland Free-Net. 216/368-2733
- **Public Technology, Inc.**
Washington, D.C., clearinghouse established to assist communities in the use of telecommunications to broaden participation. 202/626-2400
- **Santa Monica Public Electronic Network**
Santa Monica, California, community BBS. 310/458-8383

SHOP TALK

The Gray Market Revisited

Your criticism of "unauthorized" dealers ["A Trip to the Gray Market," July 1992] is unfair to hundreds of direct marketing firms and may mislead consumers.

Direct marketing firms buy their equipment from either the manufacturer or an authorized supplier so there is no reduction in quality. Paradise Computer Products, a direct marketing firm, honors manufacturer warranties and permits returns. Both authorized and unauthorized dealers have shipping delays based on product availability. The biggest difference between retailers and direct marketers is price. Lower overhead, volume purchasing, and competition mean the consumer pays much less.

Paradise Computer Products was distressed to be the only example of the "gray market," since we did try to resolve the problems with Mr. Markus Hill's HP DeskJet 500C. The printer was shipped to him unopened and undisturbed, exactly as it was received from

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Scitor® Corporation

an authorized HP supplier. We exchanged the power supply and were prepared to exchange the defective printer. But Mr. Hill had thrown away the packing materials contrary to the published return policy on our invoices. When asked for a $20 repacking fee, he went directly to HP, taking it out of our hands.

Why discourage your readers from using the direct market option, which is just as dependable as authorized dealers yet less expensive to the consumer?

JEANNETTE MEDRANO
DIRECTOR OF CUSTOMER SERVICE
PARADISE COMPUTER PRODUCTS

Editor's note: Paradise Computer Products attempted to respond to our inquiry, but the article had already gone to print. The company was not involved with the complaint lodged by Michael Brock that was discussed in the same article.

What Happened to the "Free" Replacement Policy?

I have either been cheated or subjected to deceptive sales tactics. Based on an advertisement for Hard Drives International, which promised a 30-day, worry-free guarantee and a free one-year replacement policy, I purchased a hard drive controller from the company. When I placed the order, the salesperson quoted the price as $89, which he said included a one-year replacement policy. To my surprise, my invoice shows that the actual cost of the controller was $79 and that I was charged $10 for the replacement policy, which is advertised as "free with every purchase." At no time did the salesperson discuss or disclose this charge.

JOHN R. ZIMMERMAN
WALDWICK, NEW JERSEY

Editor's note: According to a representative of Hard Drives International, Zimmerman was charged $10 for an extension of the free one-year replacement warranty. "The price quoted was for a two-year replacement policy, as listed on the invoice," says sales executive Don Bramlett. Hard Drives has agreed to refund Zimmerman the $10 levied for the extension of the replacement warranty.

Shrink-Wrapped, but Not New

In response to Stewart O. Seman's letter about getting reshrink-wrapped software from CompUSA [*Consumer Watch,* June 1992]: At a major software retailer where I worked, employees regularly took software home "to learn" and then brought it back the next day for repackaging. The software was checked out at night, then reshrink-wrapped with a blower and press in the back.

NAME WITHHELD BY REQUEST

I bought *PageMaker* from the Torrance, California, CompUSA store several months ago; it was the only copy on the shelf that day. When I opened the package, I found that the disk envelope had been opened, even though the box

POWER TIP NO. 257

FASTER WINWORD PRINTING

Here's a trick for getting back control of *Word for Windows* faster while printing a long document. First, take your printer off line (if you're not sure how, just turn it off), then print your document as you normally would. When Print Manager tells you that it cannot write to the printer port, click *OK*. Once *Word* is finished "printing," enter Print Manager and select *Resume*. Now, while your document prints in the background, you can get back to work. This technique works in *Windows 3.0* but has no effect in *3.1*.

Eric Newman
Bethel Park, Pennsylvania

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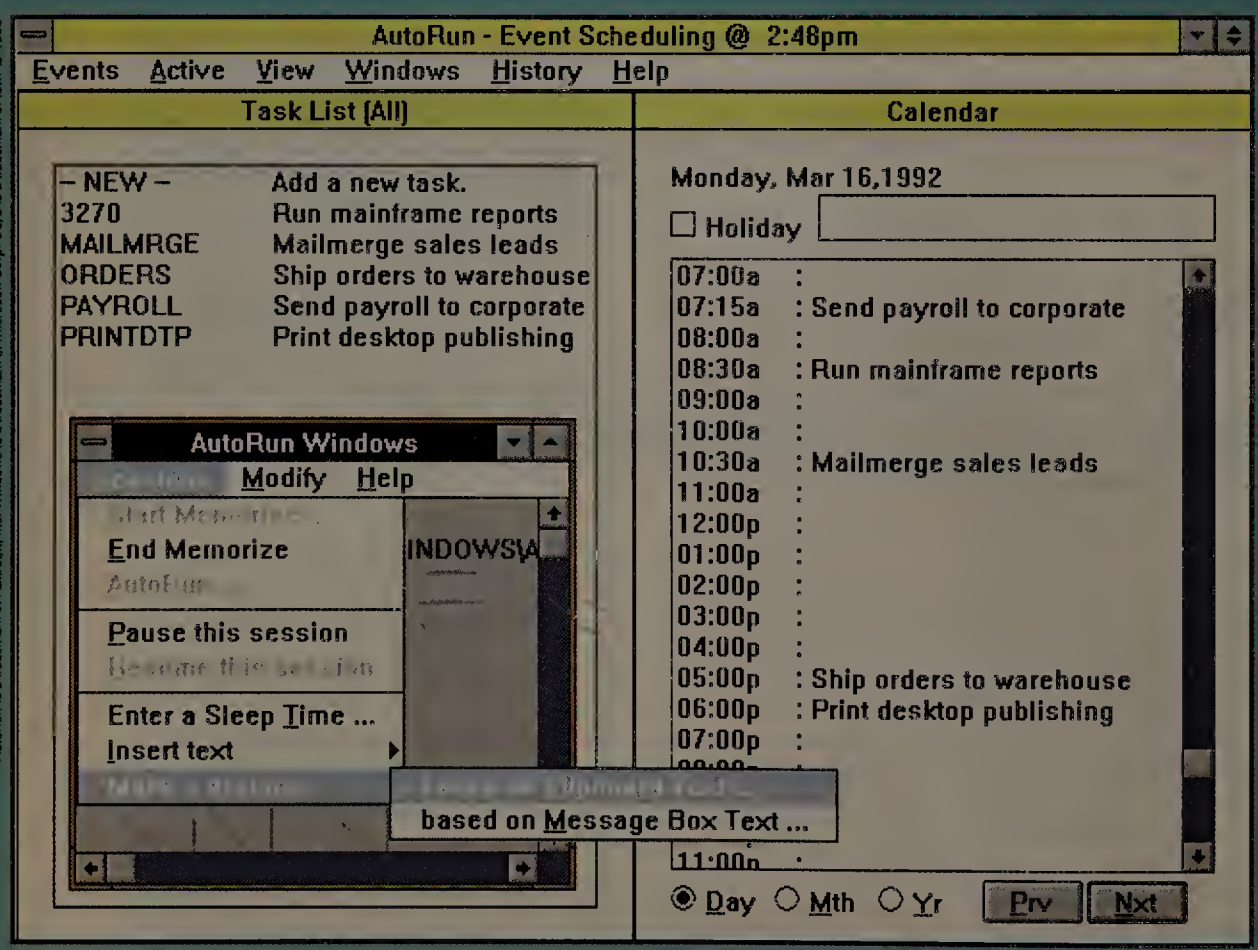

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was shrink-wrapped. I returned the software and went home empty-handed.

A couple of months ago, I took my brother-in-law to the same CompUSA store to buy a copy of *Adobe Type Manager 2.0*. Again, they had only one copy on the shelf. My brother-in-law bought it and opened the package in the car, only to find an empty cellophane bag and a copy of the *1-2-3* Pocket Reference Guide inside. No disks, no *ATM*. This package was also shrink-wrapped. The guy at the customer service counter had no comment when we showed him the contents of the box. He just threw it on a stack of stuff on the floor.

ROBIN KASPAR
SOUTH GATE, CALIFORNIA

Last Christmas my wife bought me a shrink-wrapped copy of *Word for Windows 2.0* from Fry's Electronics in Sunnyvale, California. When I opened the box, I discovered that the plastic bag holding the 3½-inch disks was partially opened. Feeling fearless, I installed it, then promptly checked out the "About" information.

The package was already registered to another user—a resident of Hong Kong. After installation, I detected a virus in the COMMAND.COM file. This experience just serves as a reminder to scan for viruses, even when installing shrink-wrapped software.

CHARLES JACKSON
MOUNTAIN VIEW, CALIFORNIA

Editor's note: Our mail indicates that many stores reshrink-wrap software packages—without first checking the contents. Jackson's advice to check all new software for viruses is well taken, but it doesn't address the root of the problem. We encourage everyone involved in the software distribution process—developers, distributors, retailers—to reevaluate their return policies. Customers, for their part, should register their outrage by refusing to purchase goods from any retailer or distributor that sells repackaged software as new.

A Different OSM

It has come to my attention that a company using the acronym "OSM" out of Van Nuys, California, is involved in a mail-fraud scam [see "Consumer Watch Special Report: Scam!" May 1992].

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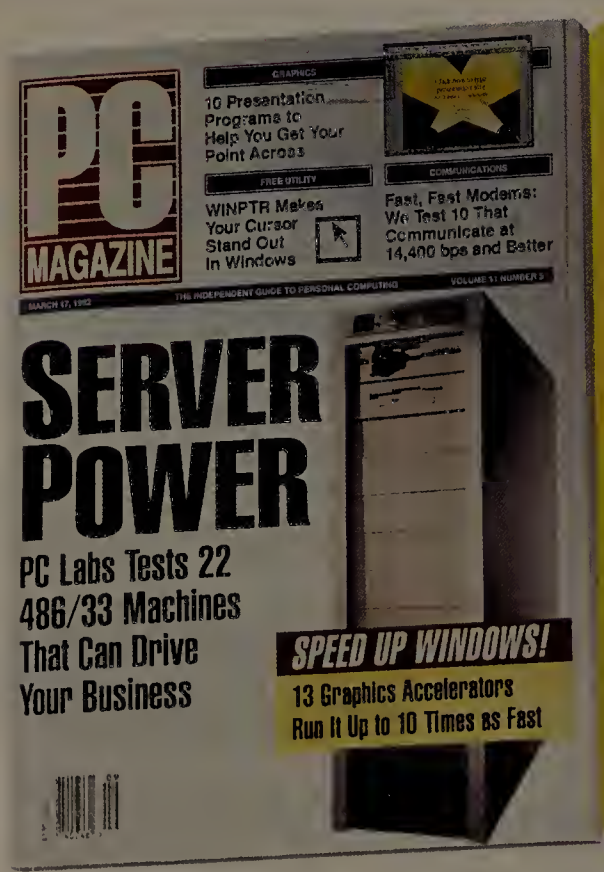

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March 17, 1992
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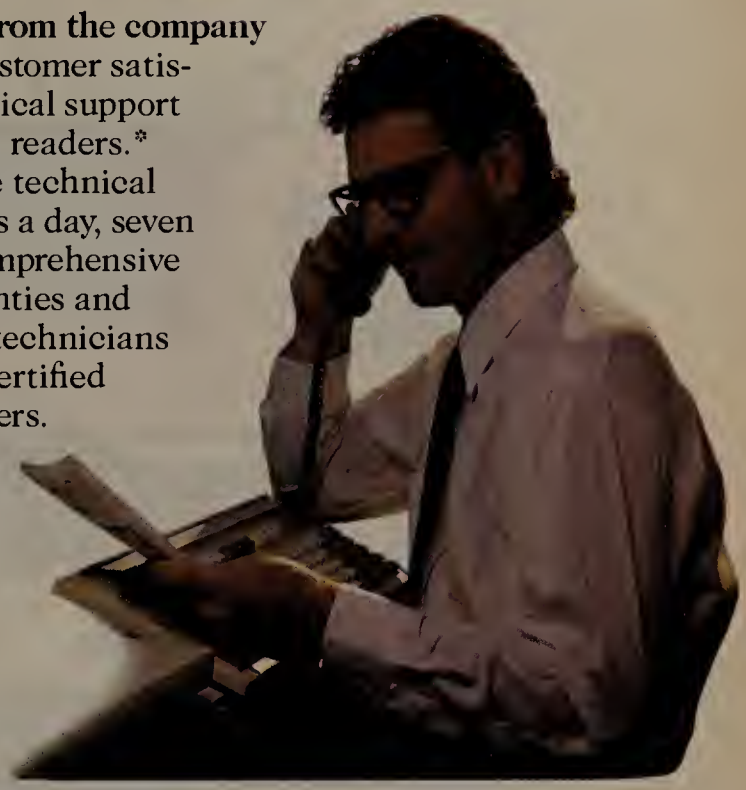

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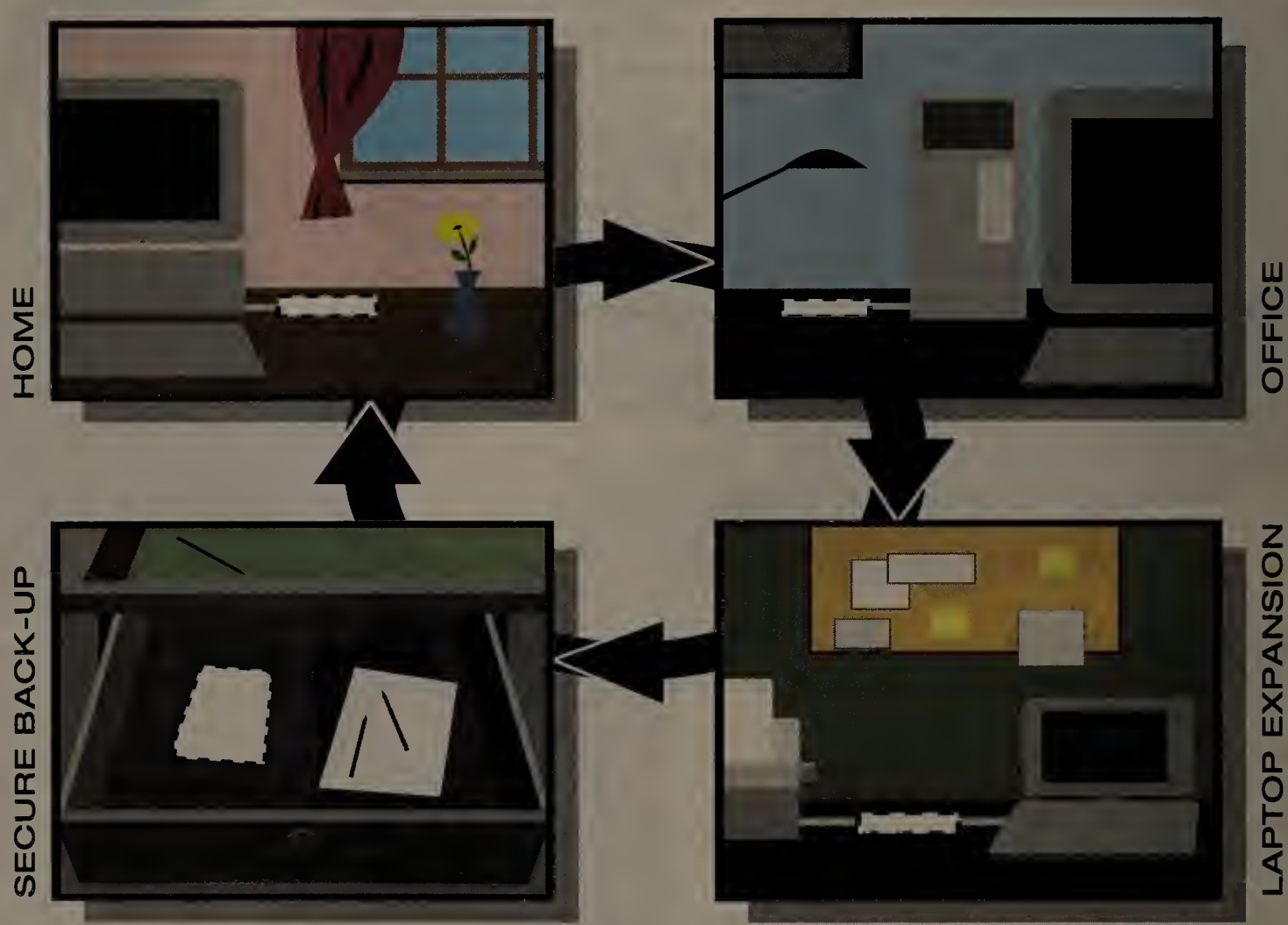

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WHAT ? NEXT

By MIKE HOGAN

Is That Your E-Mail Ticking?

MICHAEL LLEWELLYN

"Dear (*your name here*):

No, I wasn't the one who took the July PC World *off your desk. I don't have an extra copy of* WordPerfect 5.0. *I work in Los Angeles, so I can't make whosit's going-away party in the San Francisco cafeteria this afternoon. Oh, and the dozen of you copying me on the plot line for the computing seagull novel—honest, I've got nothing to contribute."*

I'll never get up the courage to actually send such a message and rid myself of irrelevant mail. But I still dream of having a cherry bomb icon that would attach itself to half my E-mail.

Okay, I'm irascible. But let him who has never left his voice mail on all day to get work done cast the first brickbat. That's why voice mail was invented, isn't it? But where ya' gonna hide from E-mail? Anyone with a keyboard can reach out and touch your PC with a beeping "READ ME NOW"—or worse, leave a message that requires a quick response.

And if you think E-mail, voice mail, MCI, CompuServe and the like already take too big a chunk of your workday, buckle up. Communication will become an even larger part of your job, you knowledge worker you, as virtually all our major E-mail systems get beefed up with "mail enabled" groupware.

Here's a taste: Microsoft's new *Schedule+* broadcasts your calendar/Day-Timer over *Microsoft Mail 3.0* so your fellow inmates with proper clearance (who can you justify hiding from?) can get a quick look. It's that much easier to, say, book you into a late Friday afternoon meet-a-thon before you have a chance to pencil in that third funeral for Aunt Sally.

But the success of *Lotus Notes* has vendors working overtime on their own group application development engines. Microsoft has thrown more resources up against the group-work theme than any other project, so soon *Mail* will gain add-ons that design and route intelligent forms and manage projects, group documents, and other workflow elements. So will *WordPerfect Office.*

Yes, the technology is almost sure to enhance user productivity. While that's not to be confused with lightening your workload, there's a cherry bomb builder or two in there as well. The new *BeyondMail for Windows* rule-based helpers filter incoming mail so messages can be filed or trashed according to priorities you set. They also recognize event triggers—so just forward that budget message to your boss while you're at the beach (and automatically route all the extraneous E-mail time killers to the person who got your promotion). Active agents are high on everybody's feature list and should make it into both *Notes 3.0* and *cc:Mail for Windows 2.0* by the end of this year.

Meanwhile a new version of *JetForm for E-Mail/G* for *Mail 3.0* will combine its own scripting capability with *Windows* DDE to make forms do still more amazing things. A purchase order could, say, launch and crunch data in a spreadsheet, data base, or other application, the results of which would determine the form's next destination. Very cool. Of course, there'll be nowhere to run, nowhere to hide from these multiple independent reentry vehicles.

And the forecast is for more showers. The Electronic Mail Association estimates that the volume of E-mail will grow by more than half this year, to 6 billion messages. And with my luck, they'll all have my name on them.

WHAT TO WATCH

Never learned to type? Don't like mice? Digitan Systems' **DigiSound Pro** is a DSP-based sound board that will let you train your computer to recognize a wide array of clearly spoken voice commands regardless of accent; it's due in September for an under-$250 street price .... About that time, Okidata will release what could be the ultimate input/output device; **Doc.It** is a high-quality laser printer/electronic and plain-paper fax/copier/scanner combo, one of whose configurations will sell for under $2900 at dealers .... Portables leader **Toshiba** has a new line of **notebooks** that will debut in September and meet the aggressive prices set by recent Compaq and Dell introductions .... And vendors say that Intel will follow its next-generation P-5 processor, due this fall, with an oversize **OverDrive** socket that will let 486DX2 systems accommodate a 32-bit "SX" version of the P-5. Contact me at 310/312-8041 or MCI Mail, 329-2648.

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LAN TIMES READERS CHOICE 1992

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Edited by RUSSELL GLITMAN

Sticker Shock: Software Prices Drop

Declines Follow Hardware Price Plunge as Vendors Vie for Users

Application Price War

Street prices of selected packages

	January	July
Excel	$329	$299
1-2-3 for Windows	$399	$335
1-2-3 3.x	$429	$399
Word for Windows	$329	$299
WordPerfect for Windows	$279	$279
WordPerfect for DOS	$265	$265
Freelance Graphics for Windows	$359	$349
Harvard Graphics for Windows	$419	$369
Harvard Graphics for DOS	$419	$399

Windows applications prices slipped this year. Competitive upgrades offer more dramatic savings—for example, 1-2-3 users who switch to Excel pay $129 or less.

There are plenty of attractively priced candidates for your vote in this year's punishing campaign for *Windows* application leadership. That's because we're in the middle of a software price war, an increasingly cutthroat battle between vendors for new *Windows* users, combined with an abrupt fall in hardware prices.

The numbers tell the story. You can typically move from your aging DOS package to a rival vendor's flashy *Windows* entry for something like $100.

And deal making is unfettered with large corporate accounts: "We've seen everything from 0 to 100 percent discounts," says Robert Weiler, Lotus senior vice president for North American business. Weiler fingers Microsoft as the instigator, and *Soft-letter* editor and publisher Jeffrey Tarter agrees: "It's no accident that price cutting started as soon as there were alternatives to *Word* and *Excel*."

Microsoft is responding to "a bulge in the marketplace as people migrate to *Windows*," retorts Kathleen Schoenfelder, Microsoft's product manager for *Windows* apps. Schoenfelder says Microsoft released its competitive upgrades so cheaply because they couldn't cost more than upgrades to Microsoft products. Otherwise, "our discount structure hasn't slipped," she says.

Be that as it may, low prices have contributed to a surge in *Windows* application sales. Corporate Software reports that unit shipments of *Windows* applications outpaced DOS programs in June for the first time ever.

The avalanche of low-cost PCs such as Dell's $1259 Dimension 386SX/25 and $1699 Dimension 486SX/25 helps keep prices low because users expect to pay much less for software than hardware—traditionally about 10 percent of the cost of hardware. And increasingly, hardware vendors sweeten the sale with bundled programs. "Even Compaq is bundling *PFS:WindowWorks*. What is the world coming to?" marvels Metro Computing president John Murphy.

—*Eric Bender*

Zeos Gets Back on Track With New Notes

Zeos Int'l added a new twist to notebook designs in July with the introduction of a tilt-and-swivel VGA display that makes for better viewing by large groups and easier operation in cramped quarters. The Freestyle/SL notebook comes hard on the heels of the company's aggressively priced Color Notebook, a 6.7-pound unit with a passive-matrix display. The St. Paul direct marketer also jumped into the promising hand-held market with the 1.3-pound Pocket PC.

Freestyle represents the third generation of notebooks from Zeos but is the first to be designed and manufactured by the company.

"Zeos has invested a lot of money to bring manufacturing to the U.S. instead of going through OEMs," says Richard Zwetchkenbaum, senior analyst with International Data Corporation, a market research firm in Framingham, Massachusetts. That should cut costs and give Zeos more control over product development, says Zwetchkenbaum.

The $1895 Freestyle and the $2695 Color Notebook use Intel's 25-MHz 386SL chip to enhance power management. Zeos claims the 5.6-pound Freestyle gets 4 hours of continuous battery operation from a single charge. It comes with 2MB of RAM upgradable to 20MB, a 60MB hard drive, a 3½-inch floppy drive, and a keyboard pointing device.

Users can swivel the Freestyle's 9½-inch display 30 degrees to the left or right and 45 degrees back.

Zeos joins the growing ranks of subnotebook providers with its 1.3-pound palmtop PC for $595. Bundled with DOS 5.0 and *Microsoft Works*, the Pocket PC has 1MB of RAM and two PCMCIA memory card slots. It measures 9½ by 4½ inches and stands 1 inch tall. The 81-key keyboard is smaller than your desktop's but serviceable and larger than the keyboard on Hewlett-Packard's 95LX.

The tilt-and-swivel display of the Zeos Freestyle/SL notebook aids viewing in tight spaces or when you give presentations.

—*Russell Glitman*

AT&T, Intel Face Off Over Hand-Helds

Battle lines are being drawn for what promises to be a hotly contested hand-held PC market. AT&T Microelectronics and Go Corporation, the Foster City, California, maker of the PenPoint operating system, will team up to create a line of "personal communicators"—lightweight, portable devices that combine pen input, fax, paging, E-mail, and cellular communications. The devices, which should appear sometime next year, are expected to cost between $1000 and $1500, dropping to $300 by 1995.

While AT&T officials have been mum on details of the RISC-based Hobbit microprocessor that will power its hand-held PCs, the chip is two to three times faster than a 386 and "comparable to a 486," says Michael Slater, editor of the *Microprocessor Report*. The 3-volt chip will integrate the CPU, a digital signal processor, and other support functions to offer low power consumption and advanced telecommunications.

Meanwhile, Intel Corporation has teamed up with VLSI Technology of San Jose, California, to develop a version of Intel's low-power 386SL chip for hand-held devices. Devices with the Intel-VLSI chip should reach the market by year-end 1993, the companies say. AT&T and Intel are "going after the same market," says Slater, but "the AT&T focus is on communications."

According to Dataquest, a market research company in Santa Clara, California, U.S. shipments of hand-held PCs should climb from roughly 480,000 units this year to over 4 million in 1996.
—*Jeff Bertolucci*

AT&T & Go's "Personal Communicator"

- Series of lightweight, hand-held devices priced between $1000 and $1500
- Accepts pen input using Go's PenPoint operating system
- Remote messaging tools include fax, paging, E-mail, and cellular telephone
- Common interface for all tools
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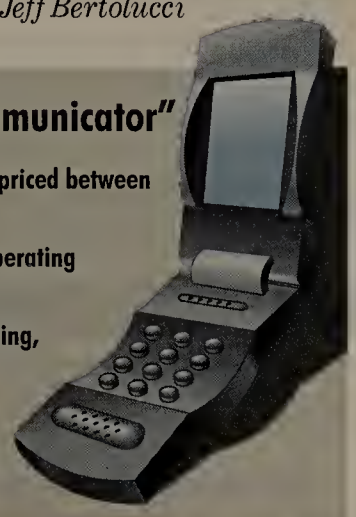


Mr. Spacely had one, you can too. Artist's vision of the Video Flip-Phone, a computer with a video display and cellular phone.

NEC First to Add PostScript on Fax

The first laser printer to combine PostScript output with easy faxing will appear in September for a street price under $2000. Outfitted with a $599 fax-modem option, NEC Technologies' Silentwriter Model 95 offers PC-controlled plain-paper faxing at the printer, plus the capability to send crisp-looking 200-dpi faxes by using PostScript to rasterize documents.

Additionally, if there's a similar device on the receiving end, the Model 95 can fax the PostScript file itself—so you're not limited to a low fax resolution, and you save on transmission costs.

The Model 95 "will redefine fax and the applications for fax," claims NEC printer marketing director John McIntyre. "We really have changed our users' behavior."

PostScript fax "is a major step in bringing business information under control," says analyst Rob Auster of BIS Strategic Decisions. "Standard fax is dumb information. This is smart information; you can store and retrieve it."

Adobe Systems will publish PostScript fax specifications in September, and other major printer suppliers will jump on the bandwagon this year, says Derek Blazensky, Adobe's PostScript fax product marketing manager. The first wave will be similar printer–fax-modem combinations, but vendors are working on other configurations, including some based on standard PC fax-modems.

Blazensky expects Apple and Microsoft to offer technologies that simplify such tasks as sending faxes from a note while on the road. "Hewlett-Packard wants to own fax," he adds, but it's unclear whether HP's approach will be built on the LaserJet's PCL language. —*Eric Bender*

NEC's Silentwriter Model 95 laser printer has a $599 PostScript faxing option.

High-Capacity-Drive Prices Start to Fall

Prices are falling fast among hard drives in the 170MB to 230MB range—far more rapidly than among smaller-capacity drives—as manufacturers finally catch up following a six-month shortfall, during which they underestimated user demand.

The drought in Winchester supply ended around midyear, say vendors, and led to two quick price cuts totaling about $150 for hard drives in the 200MB range. Prices on drives of this size should continue to ratchet down 6 to 8 percent per quarter, estimates Tim Crown, president of Insight Distribution Network. In addition to selling PCs, the Tempe, Arizona, firm distributes about 30,000 hard drive upgrades a month. Crown says prices on smaller drives are firming up as users shift to 486-based PCs with megabyte-eating *Windows* software and manufacturers cut back small-drive production in favor of higher-capacity units.

Insight's standard PC is now a 486 with a $499 205MB drive, says Crown. Similarly, most Dell computers sold are 486s configured with 170MB or 230MB drives priced at $429 and $529, respectively.

"I don't buy anything smaller than 300MB because even 200MB doesn't quite cut it," avers Jim Hansel, vice president of Union Bank of Switzerland Asset Management.

Richard Kohn, senior analyst at InStat expects sales of 60MB to 100MB drives to slip 20 percent and sales of drives larger than 100MB to grow 71 percent and dominate PC drive bays by year-end 1993. —*Mike Hogan*

A Mac Data Base for Windows

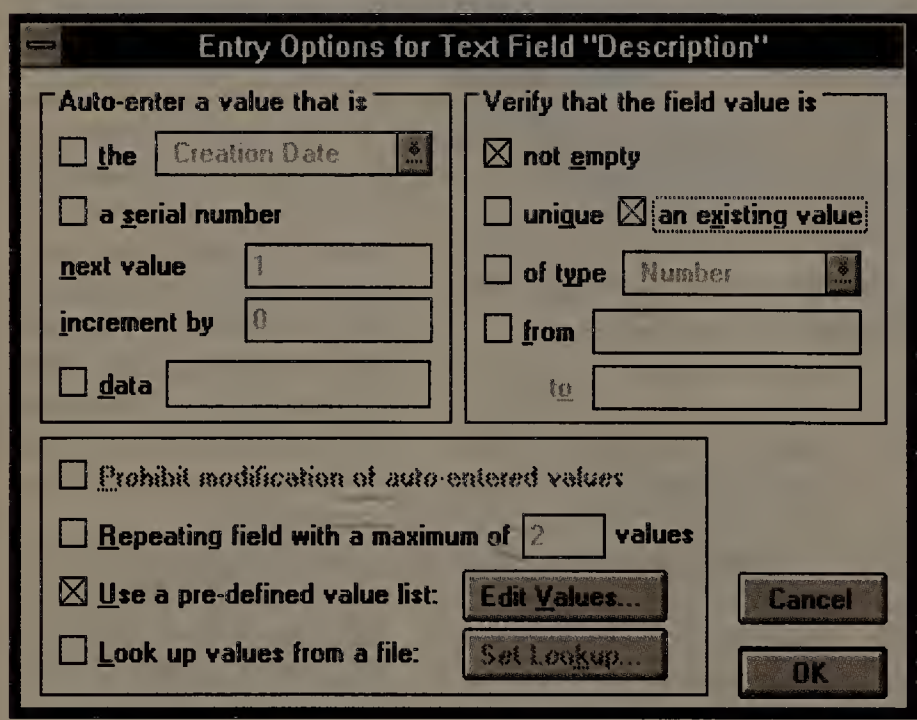
An easy-to-use, networkable, cross-platform data manager is the first salvo in Apple software subsidiary's Windows blitz.

by Robert Lauriston

Over the past year or so, Apple's legal department has been dragging *Windows* through the courts in an unsuccessful attempt to force Microsoft to make it look less like a Macintosh. Meanwhile, Apple's software subsidiary, Claris, has been working in a more positive direction. First the company entered the *Windows* market through an acquisition when Claris bought *Hollywood* from IBM. Then, the company set out to rewrite its popular line of Mac applications to run under *Windows*. The end result of that effort may be to make the two platforms more alike than ever.

Claris's first Mac program to cross the great divide is *FileMaker Pro*, a nifty flat-file data manager. *FileMaker Pro 2.0 for Windows* makes an impressive debut. (In a way it's less a debut than a return—ironically *FileMaker* started out as a Mac port of *Nutshell Plus*, a DOS program.)

FileMaker Pro offers the quick learning curve, font and graphics flexibility, and easy networking that Mac users brag about. Although it may not be the most powerful *Windows* program in the personal data manager category, it's probably the easiest to use. This is a program that takes full advantage of a graphical user interface.



You define fields in a FileMaker application by checking options in this dialog box. With the options shown, when a user tabs into or clicks on the Description field in a new record, a predefined value list of suggested entries pops up. FileMaker will prompt for confirmation before accepting a description not found elsewhere in the file and will refuse to save the record if the description field is empty.

Click and Query

As you would expect from the company that popularized the graphical interface, *FileMaker* is mouse driven. You define data base fields by checking buttons in a dialog box and design forms for displaying or printing data by drawing boxes with the mouse. Select the Find command, and any form becomes a query dialog box. Just enter the data or range of data you want to find using simple syntax, such as 'f' for names beginning with A through E, or '4/1/92 . . . 6/30/92' for all records from the second quarter of this year. If the query doesn't produce the data you want, use Refind, expanding or narrowing the search criteria, as many times as you wish.

FileMaker's simple design makes getting started particularly easy. An inexperienced user can quickly design a data entry form and start entering information, modifying the application on the fly as necessary. Need an extra field for fax numbers? Create it with a few mouse clicks, then go right on entering data. Too much text to fit in the field? The bottom border of the field drops down to make room, and the text wraps automatically. The field pops back to normal size when you finish editing, but you can enlarge it permanently just by dragging its corners. Special commands automate printing of columnar reports, envelopes, or 50 different Avery label formats. With occasional help from a power user, even computerphobes can develop fairly complex *FileMaker* apps.

You probably wouldn't want to build your company's general ledger accounting system with *FileMaker*, but the program can do some surprisingly sophisticated things. While it's not truly relational, you can look up data from other files automatically. For instance, when you enter a person's name in your private contact data base, *FileMaker* can automatically pull in the person's address from your company's master file. To keep your contact data base up to date, you can use a start-up macro to update it against the master address list every time you open the file.

Other fancy *FileMaker* options let you make data entry faster and more accurate. You can define a list of common entries for a field and display that list as a group of radio buttons (choose one) or check boxes (check all that apply), or as a scrolling menu that pops up when you tab into the field. Other options let you restrict a field's entries to that same list or to a range of values, and specify that a record can't be saved if the field is blank. If you wish, the program can create a serial number for each new record automatically and track the date and time it was created and last modified, and on a network, it can track the person who modified it.

Cross-Platform, Network Skills

FileMaker Pro's most singular advantage is its cross-platform compatibility. The Mac and

Windows programs are nearly identical, and they use the same file format. That means an application created with the *Windows* version can be run on a Mac without modification, and vice versa.

I opened half a dozen Mac *FileMaker* apps with the beta *Windows* version and found they worked perfectly. In a few cases I had to widen fields or reduce type size a point or two in order to adjust for the two platforms' slightly different fonts, but you can easily avoid that problem by using either *Adobe Type Manager* or TrueType fonts on both platforms.

Networking smarts are *FileMaker Pro*'s other major distinction. Since peer-to-peer networking capability is built into the program, you can share not only the data bases stored on your file server but those on other users' personal hard disks as well. A flexible password system lets the data base's "owner" restrict the data so a particular person or group can view, edit, or print. The owner can also specify who is able to create or delete records or revise the application itself. For example, only members of the personnel department would be able to add new records to an employee information data base, and only managers would be allowed to have access to the salary field.

This built-in networking eliminates the usual hassle of configuring a shared data base on your NetWare server, but it imposes a of couple limitations. Although PCs and Macs can share *FileMaker* files on AppleTalk networks, on NetWare LANs they currently must take turns. (That limitation will go away once Novell ships Macintosh drivers that use the same protocol PCs do.) *FileMaker* sharing is also restricted to about 25 workstations at a time, though any number of users can have read-only access to a file stored on the server.

Now that *FileMaker Pro* has broken the platform barrier, you can expect more *Windows* versions of Claris applications soon. The company has hinted strongly that the next bite off the old apple will be *MacDraw*, but a more exciting prospect is *Claris Works*, which is best of breed among Mac integrated software packages and sets a new standard for ease of use. Other Mac products Claris may bring to *Windows* include *MacWrite, MacPaint, MacProject, Claris CAD, SmartForm Designer*, and the *HyperCard* authoring packages.

Robert Lauriston is a contributing editor for PC World.

SNAPSHOT

FileMaker Pro 2.0 for Windows

WINDOWS The first Windows program from Apple Computer's Claris offers Mac-style ease of use and no-hassle networking.

KEY FEATURES

- **Mouse-driven application design**
- **Network file sharing**
- **Common file format with Mac version**
- **Automatic layout of label sheets**

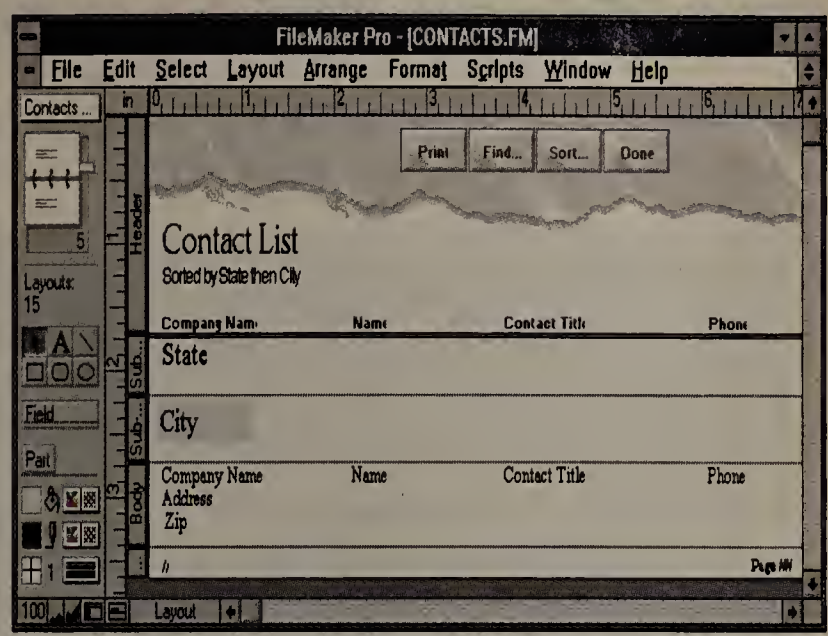
AVAILABILITY

Fall 1992

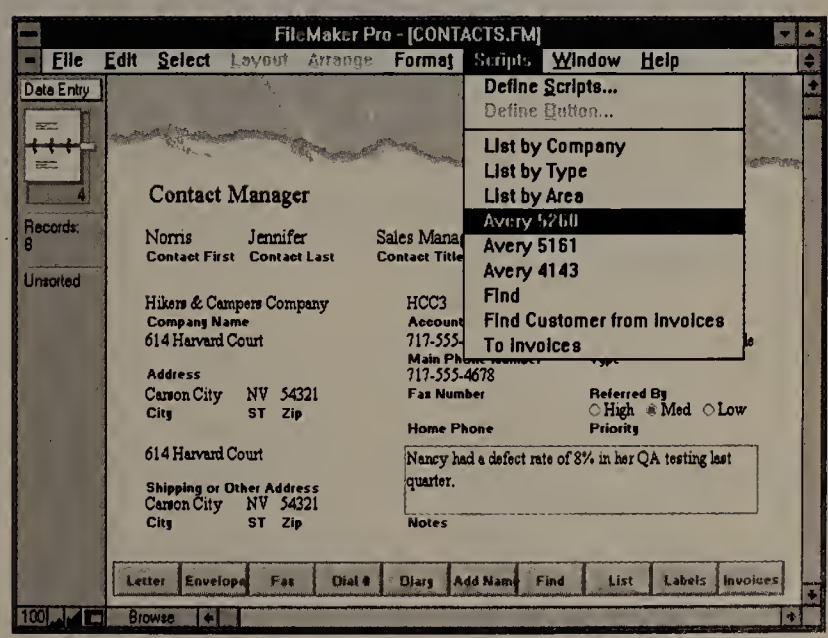
PRICING

$399; network pricing not yet available

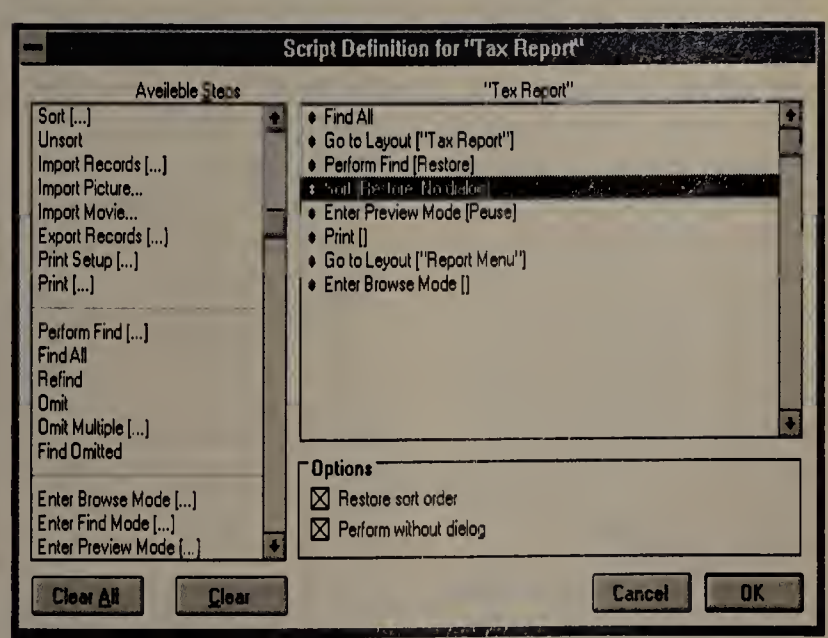
Claris Corp.
5201 Patrick Henry Dr.
Box 58168
Santa Clara, CA
95052-8168
408/727-8227
Reader service no. 704



To create or modify FileMaker forms, switch into Layout mode. This form is a band-style report. To add information, click and drag the Field button at left.



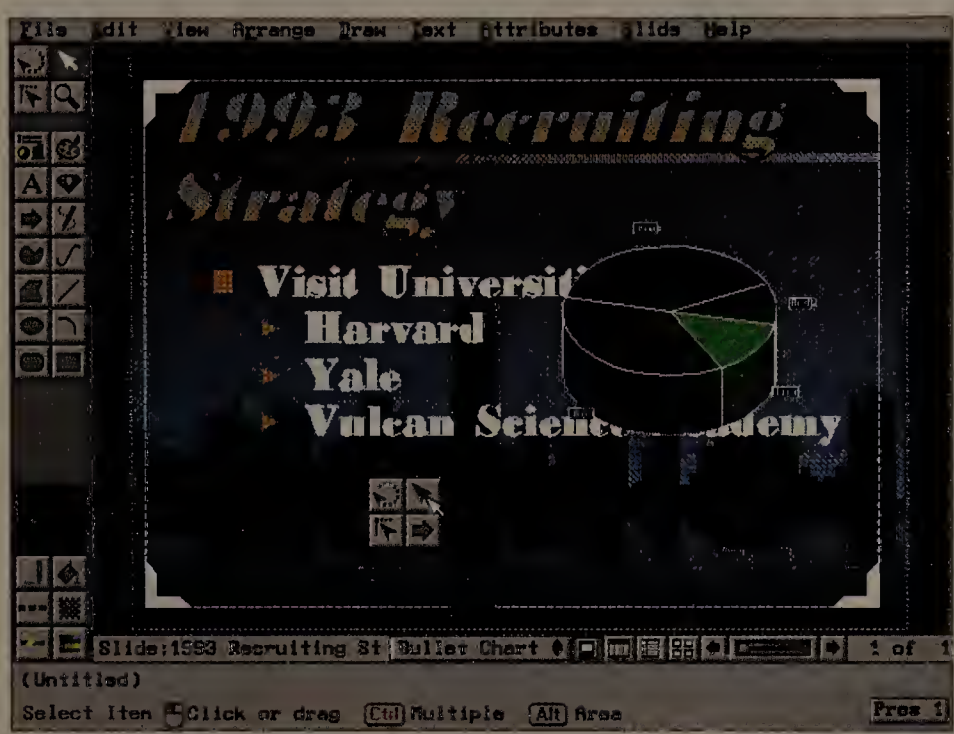
FileMaker's macros let you customize FileMaker apps to automate routine tasks. You can run the macros from the Scripts menu or by pushing buttons like those at the bottom of the screen.



FileMaker's scripts let you automate most data base tasks, such as these steps in producing a tax report. To add a command to a script, double-click on one of the items in the command list at left.

DrawPerfect 2.0: Harvard Beware

WordPerfect's latest DOS presentation graphics program does a great imitation of Windows, without the hardware demands.



DrawPerfect looks and feels just like Windows, but without all the hardware and memory overhead. DOS devotees now have access to an easy-to-use interface and impressive graphics.

by Christina Wood

If you're a DOS devotee or don't have the hardware for *Windows,* you might be harboring a secret envy of the features and graphical interface of *Windows* presentation programs. Well, launch *DrawPerfect 2.0* and laugh. It's as much like *Windows* as DOS gets. Even industry leader *Harvard Graphics* for DOS doesn't look as graphical or as slick.

No more steep learning curve and obscure commands. *DrawPerfect 2.0*—from the folks who bring you *WordPerfect*—has the look and feel of *Windows* without the overhead. It has a customizable button bar, supports copy and paste from its own *Windows*-inspired clipboard, and lets you drag and drop objects or text with your mouse.

DrawPerfect 2.0's imitation of *Windows* is so seamless that it understands standard *Windows* keystrokes and mouse movements, as well as commands already familiar to *WordPerfect* users. It's no longer necessary to know the secrets of the <F7> key, but if you possess this arcane knowledge, feel free to use it.

Although *DrawPerfect* is a full presentation package, it looks like a draw program when you load it. Click on *Create Presentation* to get down to business. There are 50 colorful master slides, all editable. You can enter text directly to a slide, type text in an outliner reminiscent of Aldus's *Windows* mainstay *Persuasion*, or import an existing outline from *WordPerfect.*

Creating charts follows standard procedure. Enter the data in *DrawPerfect 2.0*'s spreadsheet look-alike or import data from *1-2-3, Excel, Quattro Pro,* or *PlanPerfect.* Choose your chart type—including 3-D, trend analysis, and surface charts—from a gallery of thumbnails. You can even rotate a chart in three dimensions.

Born to Draw

As its name suggests, *DrawPerfect* has its roots in drawing. Along with a *Windows*-like icon bar of draw tools, dialog boxes give you access to 16.7 million colors for gradient or solid fills. You can blend from one shape to another, create shadows behind objects, and adjust the shadow's depth, placement, color, and transparency. The arrow tool lets you create and edit arrows with a click of the mouse, while another tool rotates objects on any point.

Previous versions handled text awkwardly; *2.0* is a substantial improvement. You can fit text to a path and fill text with patterns or gradient fills. *DrawPerfect* has a spelling checker, its own scalable fonts, and seven Bitstream fonts and supports HP III and PostScript scalable printer fonts.

The paint icon opens a window to something *Harvard Graphics* doesn't have—image editing tools. You can edit scanned art pixel by pixel or paint an image from scratch, convert a line drawing into a bit map and paint on it, or convert a scanned image into line art and edit it with the drawing tools. And don't worry about mistakes: Undo is limited only by hard disk capacity.

Drag and drop the completed slides to adjust their order in the slide sorter. Though common in *Windows* products, *Presentation Express II* is the only other DOS program we've seen with this feature.

Output your presentation to virtually any printer or any of the four major slide services. Better yet, give a screen show: *DrawPerfect* features 14 transition options—screen wipes, fades, and so on—and you can attach sound files (over 100 MIDI files are included) so music plays in the background and commentary enhances individual slides. This is DOS?

If this doesn't dazzle 'em, use the "highlighter"—sort of a digital Magic Marker—to write on the slide via the mouse. Microsoft's *PowerPoint for Windows 3.0* is the only other program we know of that can do this.

If your *Windows*-using pals envy the effects you're getting on your 286, WordPerfect has a solution: A *Windows* version, reputed to be this program's twin, should be out by the end of the year. But with DOS looking this good, why switch?

Christina Wood is an assistant editor for PC World.

SNAPSHOT

DrawPerfect 2.0

WordPerfect's DOS presentation graphics package goes GUI.

KEY FEATURES

- **Graphical interface looks and feels like Windows**
- **Built-in paint, draw, and chart modules**
- **Multimedia screen show capabilities**

AVAILABILITY

September 1992

PRICING

$495; upgrade for registered users $99; competitive upgrade $150

WordPerfect Corp.
1555 N. Technology Way
Orem, UT 84057
800/451-5151,
801/222-5077 (fax)
Reader service no. 703

Iomega Tape Drives: A Backup First

New DC2000 tape drives are the first to read QIC-80 and Irwin tapes.

by Rex Farrance

Repeat after me: Backing up is *not* just necessary drudgery on a par with flossing teeth—backing up can be painless and unintrusive.

You can say that with conviction if you have a tape drive plus *Windows* software that lets you schedule background backups, which run automatically without interrupting your work. Speedy business-class PCs with big hard disks are taking over—so more and more buyers are getting the message and opting for tape as *the* choice for safe, efficient workstation backup.

Iomega's new Tape250 QIC-80 backup systems offer just such a solution, and more. The drives come with *Windows* software that lets you schedule unattended backups, and their multiformat compatibility and overall ease of use make them a clear standout in the fast-growing tape drive market.

QIC Meets Irwin

The Tape250 QIC-80 backup systems have a unique and noteworthy talent—the capability to read an Irwin *EzTape* backup on a servo format tape. Iomega, maker of the highly regarded Bernoulli box, accomplishes this trick not by deciphering Irwin's proprietary Accutrak servo format but by reading the data directly. Why is this capability so important? Until now, buying any vendor's QIC-80 drives has meant giving up the ability to recover backups from your old Irwin tapes. And offices around the country are loaded with Irwin products, bought as add-ons or factory installed in Compaqs, IBMs, and other PCs. (Iomega estimates some 7 million tapes currently hold *EzTape* backups—the same media that QIC-80 drives read, but prepared with Irwin's inscrutable format.)

The Size Is Right

The Tape250 comes in three varieties. The Tape250 Insider is the first 1-inch-high drive that will slip into any 3½-inch bay. The Insider Half-Height adds the faceplate and rails necessary to fill a standard 5¼-inch bay (unusual mounting configurations are also available). The Tape250 PC Powered subsystem is an external unit that runs off your PC's internal power supply.

The capacity of each of these drives is just right for single-tape backups of the 100MB to 200MB hard disks on today's PCs. You can pack in as much as 250MB of data per 120MB tape if your files are particularly compressible. But you can expect about 200MB of capacity for typical business files and applications.

Each of the Tape250 drives comes bundled with special OEM versions of *Windows* and DOS *Central Point Backup,* which add the capability to read both QIC-80 tapes and Irwin *EzTape* backups. This software not only runs your tape drive but it also lets you back up to or restore from floppies.

It should be noted that *Central Point Backup 7.1 for Windows* won a Best Buy in our July roundup of backup software. Its inclusion in the package makes these new tape drives significantly more attractive. In addition, the drives come with a floppy extender card that gives you an additional connector if your floppy controller is already supporting its limit. The Iomega Tape250 PC Powered drive even throws in a branching power connector in case all of your power leads are in use. And each backup drive comes with an outstanding 24-month warranty.

All the prices listed will be discounted by dealers, so you can expect the cost of these drives to compare favorably with that of other inexpensive drives. When you combine the ability to read Irwin *EzTape* with one of the best backup programs around and add Iomega's rock-solid reputation, the deal gets pretty sweet.

Rex Farrance is an assistant editor for PC World.

The Iomega Tape250 Insider is only 1 inch high. That's small enough to fit into a standard 3 ½-inch drive bay.

SNAPSHOT

Iomega Tape250 Insider, Tape250 Insider Half-Height, Tape250 PC Powered

These inexpensive QIC-80 DC2000 tape backup drives are the first of their breed to be able to read an Irwin tape written with EzTape software. And the drives are trim enough to slip into a standard accessible 1-inch-high 3½-inch bay.

KEY FEATURES

- **Reads Irwin EzTape backup tapes**
- **Reads and writes QIC-80**
- **Fits in a standard 1-inch-high 3½-inch bay**
- **Two-year warranty**
- **Priced at the bottom of the market**

AVAILABILITY

Immediate

PRICING

Tape250 Insider $299, Tape250 Insider Half-Height $349, Tape250 PC Powered $499; formatted 120MB tape $35; three formatted 120MB tapes $99; 1-mbps high performance controller $150

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Roy, UT 84067
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The Toshiba T6400.

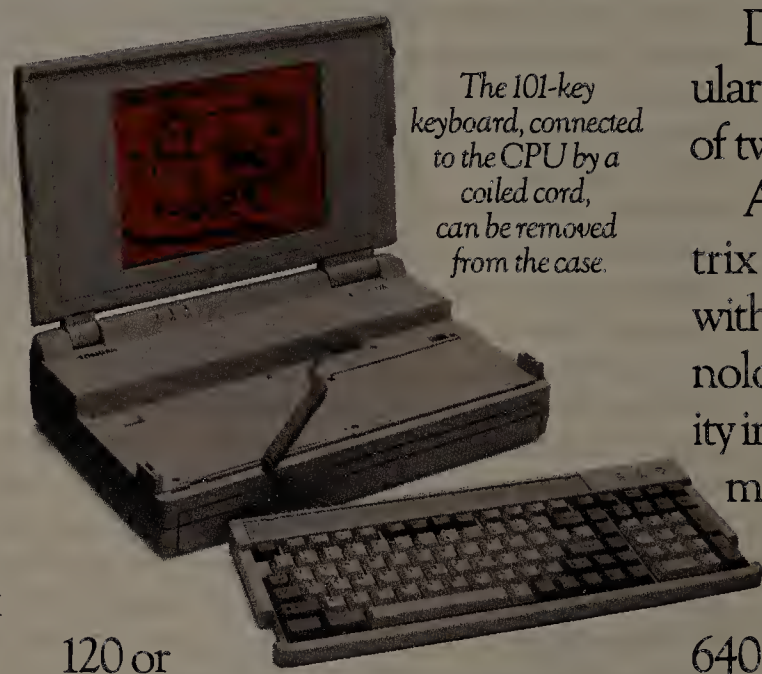
With dimensions of 15.4" W x 10.5" D x 3.3" H (4.1" H with the color screen), it's small enough to fit in a briefcase.

With a spirited clock speed of 33 MHz, a powerful 486 DX microprocessor, 8K internal cache and full 32-bit architecture, it's big enough to handle all those jobs normally performed in an impressive office building.

In addition to a 1.44MB floppy drive, you can choose a 120 or 200MB hard disk.

And if a combination like that doesn't make the T6400 portable better than the desktop computer you're currently using, we'll eat our collective hat.

This remarkable machine comes equipped with an internal 1.44MB, 3½" floppy drive and a 120 or 200MB hard disk. Plus 4MB RAM, expandable to 20MB. (Try finding any application that needs more memory than that.)



The 101-key keyboard, connected to the CPU by a coiled cord, can be removed from the case.

There's also a full-length, IBM-compatible, 16-bit expansion slot so you can take full advantage of your network card, SCSI controller or any of a myriad of other special purpose cards.

For even more expandability the T6400 comes complete with a 150-pin expansion port for direct input/output to the CPU, enabling you to connect storage and communications devices. Plus an internal dedicated modem slot, as well as built-in parallel, serial, mouse and Super VGA video ports.

The AC-powered T6400 has full desktop expandability, including an IBM-compatible, 16-bit expansion slot.

Depending on your particular needs, you can choose one of two display screens.

A state-of-the-art active matrix Super VGA color display with Thin Film Transistor technology, to deliver a higher quality image than you can get with most desktop monitors, and capable of displaying 256 simultaneous colors at 640 x 480 resolution.

Or a gas plasma display featuring 16 gray scales, also at 640 x 480 resolution, and a 100:1 contrast ratio—seven times the contrast of standard LCD displays, with ten times the display speed.

Both have a diagonal measure of 10.4" and provide simultaneous viewing capability with external Super VGA displays.

To complete the T6400's amazing metamorphosis from desktop to portable, we took a 101-key keyboard

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with full-size keys and key spacing, separate numeric keypad and eight dedicated cursor control keys, and nestled it into a compact 11.7 lb. package (12.9 lbs. with color screen). Then attached it to the CPU with a coiled cord, so you can remove it and use it on your lap (or other convenient surface).

Now, having read all of the above, you'd probably welcome more information on the T6400. If so, call us at 1-800-457-7777.

The more you learn about our products the more you'll come to understand the Toshiba philosophy: that portables are the future of personal computing.

Of course, with the introduction of the T6400 portable, it's a future that's already here.

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Screen Graphics created with Photo-Finish™, courtesy of ZSoft Corporation

Circle 255 on reader service card

Edited by RUSSELL GLITMAN

Bell Crowds the Local Bus

Hard disk controllers join video cards in Bell's new GT series.

For months now, vendors have been touting their new "local bus" computer systems. What this designation usually means is that the machines' designers have taken the video controller off the I/O bus and connected it directly to the CPU. Instead of poking along at the I/O bus's 8 to 10 MHz, local-bus video signals travel at the same speed that the system clock does—20 MHz, 33 MHz, or higher, depending on your processor—thus improving graphics speed and overall performance.

The local bus doesn't have to stop with video. Any peripheral device, such as a disk controller or network card, can benefit from the local bus connection and its inherent speed gains.

The new Bell GT desktops put both video adapter and SCSI controller on the local bus.

That's why Bell Computer Systems' new GT-series desktops are worth noting. They are among the first systems on the market to put both video and hard disk controllers on the local bus. Bell is also offering the option of local-bus ethernet controllers.

Bell is able to put these peripherals on the local bus thanks to the company's use of a slot-based design. Many vendors implement the local bus by hard-wiring a video controller chip to the motherboard. Bell has wired its local bus to proprietary 32-bit expansion slots.

The advantage that slots have over sockets is flexibility. With Bell's slots, for example, you can swap out the proprietary video controller card when Bell releases a newer version, and upgrade. Also, because Bell uses the OPTi chip set, which is emerging as the most popular local-bus implementation, chances are you'll be able to use third-party local-bus cards when they become available.

For now, the company says, its standard video (up to 1024 by 768 with 256 colors running at an ergonomic 72-Hz refresh rate) and caching disk controller will run *Windows* five times faster than a comparable ISA configuration. At press time, Bell engineers said the company planned to offer an optional SCSI controller as well.

Standard GT series systems are equipped with a 200MB hard drive (which has a 17ms average access time) and 4MB of RAM. The systems are available in a 3-slot slim-line case (all three machines are local bus but also take standard ISA cards) and in a 7-slot desktop/minitower configuration (which will have two local-bus, four 16-bit, and one 8-bit slots).

The line includes 25-, 33-, and 40-MHz 386s and 20-, 25-, and 33-MHz 486s. The company plans to release a model using the Cyrix Cx486DLC chip and will support AMD's 486 chips if and when they become available. CPUs are on modular plug-in boards, so upgrading is easy. The BIOS recognizes which CPU is being used and adjusts the system to correspond.

These machines incorporate cutting-edge technology, and buyers will pay accordingly. The bottom-of-the-line 386/25, with the standard configuration, is $3395 list (about $2400 on the street), and the top-of-the-line 486/33 lists at $4495.

For the money, Bell's GT systems should give you fast graphics and performance today, and plenty of flexibility to take advantage of new local bus cards and processors coming in the future.

—*Dan Miller*

IN BRIEF

Bell Computer Systems GT series

Six new desktop systems with both video and hard disk controllers on the local bus.

Bell Computer Systems
6615 Valjean Ave.
Van Nuys, CA 91406
800/542-2355,
818/909-3501
Reader service no. 710

The Politically Correct Printer

If you recycle computer paper, give yourself a pat on the back for doing your part for the environment. Paper, however, is only part of the problem. Targeting the PC PC user, Kyocera takes aim at your social conscience with the Ecosys a-Si FS-1500A, a 10-ppm LED printer with a toner cartridge that never needs replacing. Industry estimates put the number of discarded toner cartridges at 12 to 16 million a year in the United States alone.

Instead of trashing the toner cartridge, you simply refill it with Ecotone, a formula containing very fine ceramic particles that scrub and recondition the amorphous silicon drumhead with each use. This abrasive action doesn't harm the drumhead because amorphous silicon is the second-hardest material in the world. In fact, Kyocera guarantees the drumhead for the rated duty cycle of the printer—300,000 pages or three years. Ecotone costs $39 per 5000 pages, or .78 cents a page, which is a significant savings over traditional toner cartridges. (The list price for a Hewlett-Packard LaserJet III cartridge, for example, is $125, with an average output of 4000 pages, or 3.125 cents per page.) This means that in one year you'd spend $842 for Ecotone for a networked Kyocera a-Si printer printing 9000 pages per month. Printing the same number of pages, you'd cough up a steep $3375 for LaserJet III cartridges.

This 300-dpi printer uses Kyocera resolution enhancement to increase an image's apparent resolution to 300 by 1200 dpi, which is most noticeable when printing graphics or one of the 42 built-in scalable bar codes. Kyocera printer drivers are available for numerous popular applications and *Windows 3.1*. The Ecosys uses a proprietary page description language, Prescribe II, but Kyocera offers an optional PostScript-compatible interpreter, and the printer emulates such popular languages as HP's PCL 5.

The standard $2395 configuration ships with 1MB RAM (upgradable to 5MB), 79 bitmapped fonts and 13 scalable outline fonts,and a 250-sheet paper tray. There are slots for two PCMCIA integrated circuit cards (the kind increasingly used on laptops). You can design forms, letterhead, and other frequently printed materials and store them on the cards for easy access, which saves printer memory and eliminates downloading time.

Plug-in connectivity options include token ring, ethernet, and AppleTalk. Other options, which can be stacked under the main unit in a minitower configuration, include a 70-envelope power feeder, two additional 500-sheet paper trays, a collator, and a 15-bin intelligent sorter for networked users. —*Bruce Kinnaird*

IN BRIEF

Kyocera Ecosys a-Si FS-1500A

A versatile, medium-priced LED printer that uses environmentally sensitive technology.

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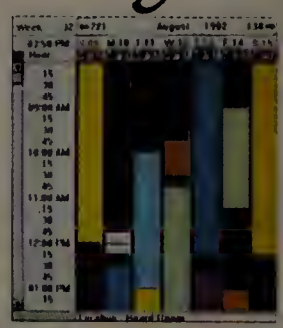

conference room, search for a free time block, send a memo to a hundred people, schedule a meeting for 25 differ-

Polaroid's Instant Images

The Polaroid CS-500i Digital Photo Scanner sets a high standard for its competitors with speedy, high-quality imaging.

Earlier this year Polaroid announced an agreement with its nemesis, Kodak, to market a product for storing and viewing color photos on CD ROM. Polaroid's contribution to this unlikely alliance is its very first entry into the scanner market, the CS-500i Digital Photo Scanner ($4495).

The 24-bit CS-500i scans a 4-by-6-inch color photograph at 125 dpi, color-corrects and sharpens the image, then displays it on your screen, all in an amazing 3 seconds. Choose to scan at 250 dpi, and you'll wait just 6 seconds; a 500-dpi scan takes all of 12 seconds, up to 100 times faster than a traditional flatbed 24-bit color scanner such as HP's ScanJet IIC. Times for 8-bit gray-scale scans are equally impressive.

This astonishing speed is a result of Polaroid's proprietary sensor technology. The way SprintScan software is bundled, it uses processing algorithms on the fly to adjust tone scales and colors to match or even surpass the quality of the orginal photo. You can save your scans as either TIFF or *Windows* BMP files.

The CS-500i is compact: 18 by 10 by 5 inches, it weighs just 15 pounds and accepts photographs as large as 4 by 6 inches. It requires a 386SX machine running at 16 MHz or faster, 4MB RAM, a video card capable of displaying 32,000 colors, and an 8-bit slot for the SCSI interface (the scanner's also Mac II compatible). Make sure you have lots of hard disk space. For instance, a typical 4-by-6-inch color photograph scanned at 125 dpi will require about 1MB.

—*Bruce Kinnaird*

IN BRIEF

Polaroid CS-500i Digital Photo Scanner

The fastest 24-bit color scanner available, suitable for desktop publishing, presentations, or storing photos on CD ROM.

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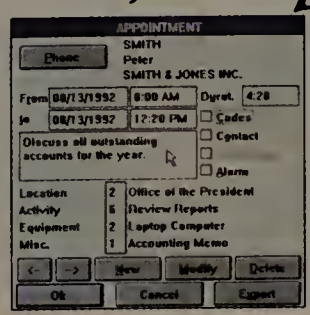

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Circle 78 on reader service card

Two Solid 386SXL Notebooks From CompuAdd

The notebook PC arena offers the best proof of the law of computer gravity: What goes up (in performance) must come down (in price). Take, for example, the latest notebook offerings from mail-order and retail clone maker CompuAdd.

CompuAdd's 325TX and 325TFX notes have 10-inch screens and low prices.

CompuAdd's pair of full-featured 25-MHz 386SX notes pack such extras as a built-in trackball and a 10-inch screen into 5-pound packages. The Austin, Texas, vendor has built its $514 million business by providing solid performance at rock-bottom prices, and its 325TX and 325TFX are no exception.

Both units are powered by an AMD 25-MHz 386SXL processor; a 1.44MB floppy drive; a 10-inch, edge-lit, VGA LCD screen; serial, parallel, keyboard, and external VGA ports; and power-management features. Both have MS-DOS 5.0 and *Windows 3.1* preinstalled. The $1595 325TX has a 60MB drive and 2MB of RAM (expandable to 8MB) but no modem, while the $2095 325TFX has an 80MB drive, 4MB of RAM, and a 9600/2400-bps internal fax-modem.

These aren't just two models of the same machine. The 5-pound 325TX measures 11.3 by 8½ by 1½ inches and has two serial ports and a built-in trackball at the upper right of its 86-key keyboard. The 5.6-pound 325TFX measures 11 by 8½ by 1.9 inches, has a serial port and a PS/2 mouse port, and sports the trackball in the lower right corner of its 84-key keyboard. The two extra keys on the 325TX keyboard are programmable for use with international character sets.

—Rob Garretson

IN BRIEF

CompuAdd 325TX, 325TFX notebooks

Two 25-MHz SX notebooks starting at $1595.

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THE LASER – SHARP, BUDGET

Insight's AMD 386SXL Note

Think the red-hot notebook market couldn't get any hotter?

Try Insight's 386SXL-25 Notebook for size. This 5.8-pound unit packs an AMD 25-MHz 386 SXL, 4MB of RAM, a 3½-inch floppy, and an 86MB hard disk—all for a checkbook-pleasing $1799.

The SXL-25's hard drive pops out for safe data storage and easy upgrade. The Insight displays 64 gray scales on its sidelit 10-inch VGA screen and comes with an 80-key keyboard. You can swap in a new battery without powering down, and in a pinch, run the machine for an hour on eight double-A alkalines.The company claims you can also suspend the system—even when running *Windows*—to squeeze more juice from the 2- to 4-hour nickel-cadmium battery.

A mouse, a carrying case, and DOS 5.0 are included. The 386SXL-25 is upgradable to 8MB RAM for $280. A 120MB hard disk costs $199, a 2400-bps internal modem $129. Insight offers a one-year warranty and will ship replacement parts—or a new unit—if your machine goes down for the count. —*Daniel Tynan*

IN BRIEF

Insight 386SXL-25 notebook

At $1799 and just under 6 pounds, this 386 notebook is priced and built to move.

Insight Computers
1912 W. Fourth St.
Tempe, AZ 85281
800/755-9628,
602/350-1176
Reader service no. 714

Big Monitors for Windows

Does *Windows* make your 14-inch monitor look like it's bursting at the seams? Mitsubishi's Diamond Pro 17 and Diamond Scan 16 give you the big picture on *Windows* apps.

The Diamond Pro's 17-inch diagonal display has a .26mm stripe pitch for big, ultra-crisp images. The $1599 Trinitron monitor's tinted CRT and antiglare coating keep you from squinting, and RGB controls let you match screen colors to printed output.

The noninterlaced Pro 17 supports resolutions up to 1280 by 1024 at refresh rates up to 60 Hz. Resolutions up to 1024 by 768 may be displayed at rates up to 76 Hz, offering flicker-free viewing for low eyestrain. A built-in microprocessor stores settings for ten operating frequencies.

Mitsubishi has chopped the price of its 16-inch Diamond Scan 16 to $1299. The noninterlaced, .28mm dot pitch monitor supports the same video modes as the Pro 17. Both units comply with MPR 2 standard for low electromagnetic emissions and have a two-year warranty. —*Daniel Tynan*

IN BRIEF

Diamond Pro 17, Diamond Scan 16

Two big color monitors that take the stroin out of running Windows.

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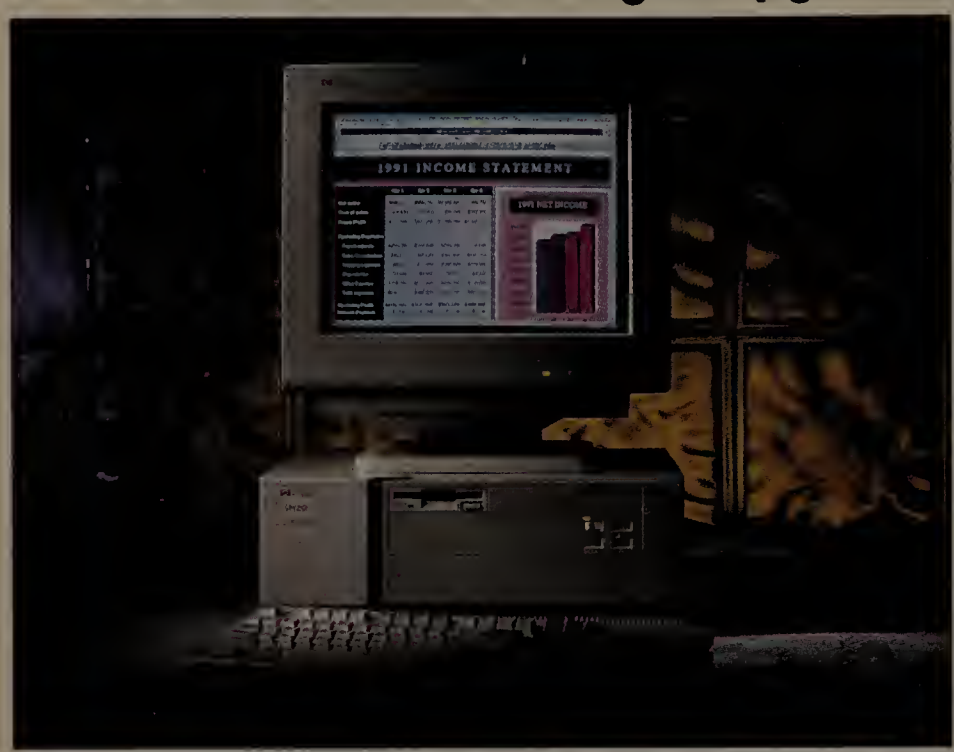
HP's Vectra 486U PCs: Eight Upgrade Options



Diversity is the theme of Hewlett-Packard's new Vectra 486U PC line. The CPU socket accepts any one of four 486 processors for easy upgrading.

Hewlett-Packard's series of upgradable EISA-bus PCs aims to fulfill the performance needs of *Windows* and CAD users; you'll also find unique upgrade options and some innovative practical touches.

The Vectra 486U PC line comes with eight upgrade options, provided via dual-speed motherboard and what the manufacturer calls the HP Universal Processor Upgrade Socket. The socket can take any one of four Intel CPUs (486DX2, OverDrive, 486DX, and 487SX); you insert the new chip without having to evict the current tenant, making the upgrade process quicker and more reliable. Users can advance from even the bottom of the 486U line, the 25-MHz 486SX, to a 66-MHz 486DX2 system when that processor becomes available from Intel Corporation. A dual-speed system board operating at 25-MHz or 33-MHz doubles your processor upgrade options.

HP has boosted system performance, especially in graphics-intensive operations, by integrating the video subsystem on a 32-bit local bus. The video supports 1024 by 768 resolution at 256 colors and uses an S3 *Windows* accelerator. The computers also feature 128K of external write-through cache memory. The video subsystem supports high vertical refresh rates of up to 72 MHz, reducing eyestrain. The machines also ship with a series of display drivers for high-resolution modes and graphic accelerators, including drivers for *Windows*, *AutoCAD*, and *CADkey*.

The Vectra 486U PC's unique control panel rotates up to 90 degrees, whether you're using the system as a tower or desktop. You won't need to use any tools to upgrade or install a board in any one of the five EISA slots—the cover is held in place by latches. Built-in diagnostics offer suggestions for fixes as well as traditional error messages. Security features include keyboard, mouse, and screen disabling and a cover lock.

The units come with 4MB of RAM, expandable to 64MB with standard SIMMs. They include a parallel port, two serial ports, support for SCSI-2 devices, a 1.44MB 3½-inch floppy, and four mass storage bays. Prices start at $2449 for the Vectra 486/25U Model 1 (no hard drive); the flagship—the Vectra 486/50U Model 430 (430MB hard drive)—lists for $5899. —*Jeff Angus*

IN BRIEF

HP Vectra 486U PCs

A new line of upgradable high-performance 486 computers with local-bus video for graphics-intensive applications.

Hewlett-Packard Co.
P.O. Box 58059
Santa Clara, CA 95051
800/752-0900
Reader service no. 716

A Solar-Powered Note? The Vortex Runs on the Sun

It's true, at least in part. Vortex Computers has introduced the Solar One, a 5½-pound notebook that uses a solar panel to recharge its internal nickel-hydride battery.

The adjustable 63-square-inch solar panel mounts atop the notebook's LCD screen. After opening the notebook, you can pivot the panel into a horizontal position to draw the most light. According to Vortex, the Solar One offers up to 9 hours of battery life in a standard office setting and up to 12 hours in sunlight. The nickel-hydride battery will power the notebook for up to 5 hours.

Other features of this unique note include Cyrix's low-voltage 25-MHz 486SLC chip, a 386/486 hybrid with a 16-bit pinout, 4MB of RAM (expandable to 12MB), a backlit 10-inch LCD screen with VGA resolution, an 81-key keyboard, a built-in trackball, a 3½-inch floppy drive, and a PCMCIA slot for adding RAM. Although exact pricing wasn't set at press time, Vortex expects the Solar One with a 60MB drive to cost between $2500 and $3000.

If you use a notebook outdoors—far from an AC outlet—you'll appreciate that the Solar One is always recharging its battery (assuming you're working in sunlight). And when you're working in an office environment, the solar panel draws energy from overhead fluorescent lights.

While an extended solar panel may prove unwieldy in cramped spaces—like on an airplane—or too delicate for the rough-and-tumble life of the road, the concept is fascinating. Who wouldn't want a notebook that continuously recharges itself?

Vortex plans to make its solar panel technology available to other notebook makers. If the Solar One proves successful, expect to see more notes adopt an environmentally correct, solar-powered design. —*Jeff Bertolucci*

IN BRIEF

Solar One notebook

A Cyrix 486SLC notebook that features a solar panel to recharge its internal battery.

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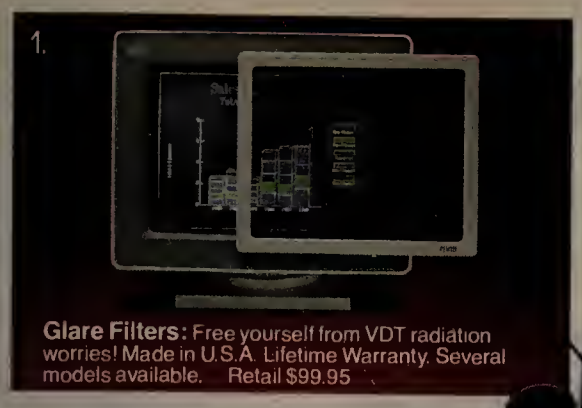

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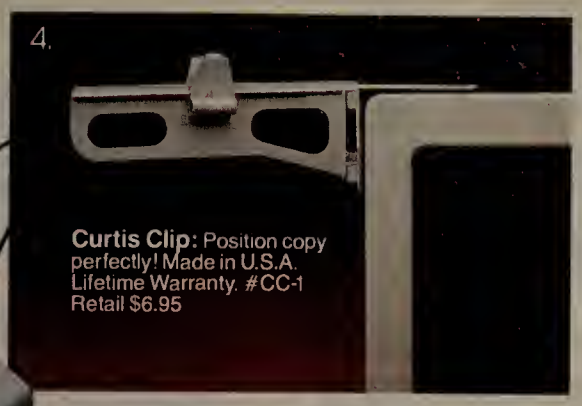

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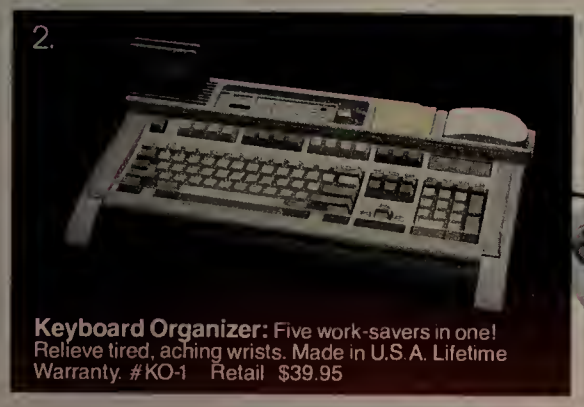

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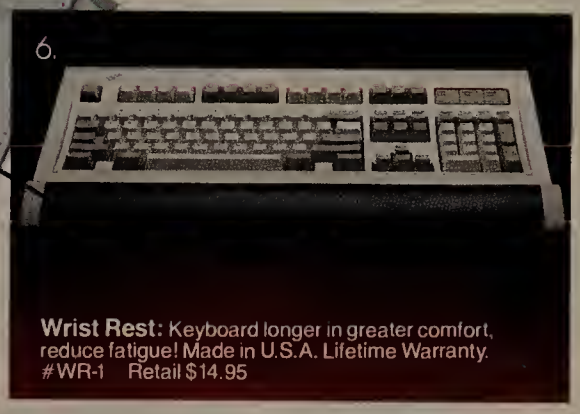

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WordPerfect Ups the Windows Ante

Interim release adds drag-and-drop capability, improved DDE support, new macros, multiple text views, and bug fixes.

An improved interim release of *WordPerfect 5.1 for Windows* adds a number of features, including multiple text views and drag-and-drop, that users have come to expect as standard fare in word processors. The latest release also fixes several bugs that plagued the initial (November, 1991) release.

This interim release, still called *WordPerfect 5.1 for Windows*, implements the drag-and-drop feature found in *Ami Pro 2.0* and *Word for Windows 2.0:* Click and drag once, and you highlight text; click and drag a second time, and you move the highlighted block. The new release features macros for creating bullets and addressing envelopes, plus more help for creating and editing macros. Users of the previous version will be glad to find that DDE support has been improved.

You can copy a section of text by simply highlighting it, holding down the <Ctrl> key, and pasting the selection anywhere. You can also see multiple views of your document. A zoom button on the ruler lets you see and edit your page in magnifications from 50 to 400 percent.

WordPerfect 5.1 for Windows catches up with the market by adding drag-and-drop—you highlight a section of text, click anywhere in the selection, and drag the text to a new location.

WordPerfect's macro capabilities also show major improvements. You can now place a macro on the button bar or add it to your macro menu. With the Bullet macro, you can automatically add bullets to selected text and change your default bullet character to any of the more than 1500 characters in the *WordPerfect* character set. A new Envelope macro makes it easier to address envelopes, and there's a useful feature that lets you add postal bar codes and include return addresses. Updates to the macro language let you create dialog boxes that have radio buttons, check boxes, colors, pop-up buttons, frames, lists, and more.

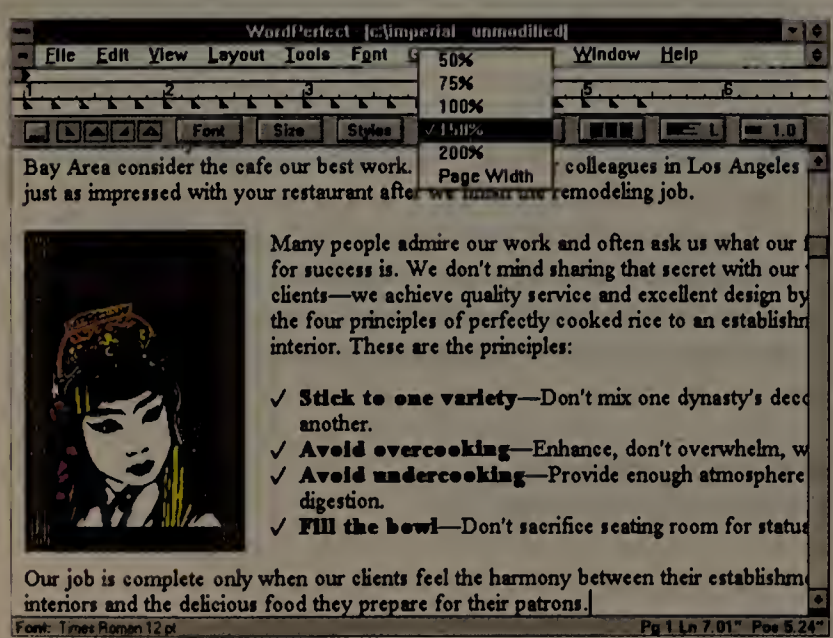
A macro command inserter program, similar to the pop-up menu in *WordPerfect 5.1* for DOS, lists all the macro commands. The on-line help includes reference information about macro commands with explanations, examples, and a tutorial. Unfortunately, you still can't convert your *WordPerfect 5.1* for DOS macros to *WordPerfect 5.1 for Windows.*

Although the product still lacks support for OLE, an improved DDE capability allows third-party developers to create macros for *WordPerfect 5.1 for Windows.* Improvements have also been made to the math table feature, which now recognizes sum, average, product, subtract, and quotient functions. As is the case with *WordPerfect 5.1* for DOS, you can assign macros, text, and other items to the alphanumeric keys on your keyboard.

WordPerfect claims it has corrected problems with handling of *Windows* metafiles and *WordPerfect*'s display on high-resolution monitors, but the product doesn't give you true WYSIWYG. Although you see headers and footers on screen in print preview mode, they do not appear in the printed output. The company has, however, remedied a problem with TIFF files that prevented you from printing true black.

You'll have to check the date of the disks after you purchase the product to determine if you have the latest release and contact WordPerfect for a free update. The original version is dated November 4, 1991; the new one April 30, 1992. While some software firms might give a new version number to such a significant upgrade, WordPerfect has chosen to wait. Current users of *WordPerfect 5.1 for Windows* can update for a mere $15. And if you call WordPerfect customer support to report a bug that's been fixed in the new release, you get the update free.

—Bronwyn Fryer



A new Zoom feature in WordPerfect 5.1 for Windows lets you edit your page in magnifications from 50 to 400 percent.

IN BRIEF

WordPerfect 5.1 for Windows
(interim release)

WINDOWS An interim release to WordPerfect 5.1 for Windows adds drag-and-drop and new macro features and provides bug fixes users have been waiting for.

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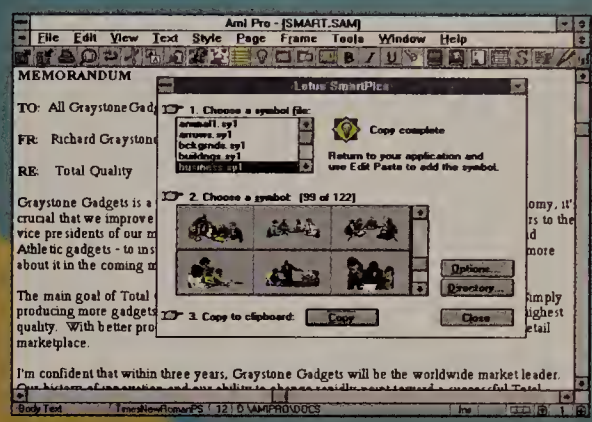

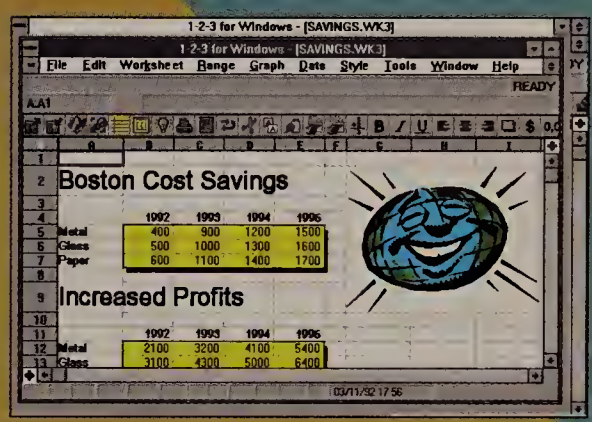

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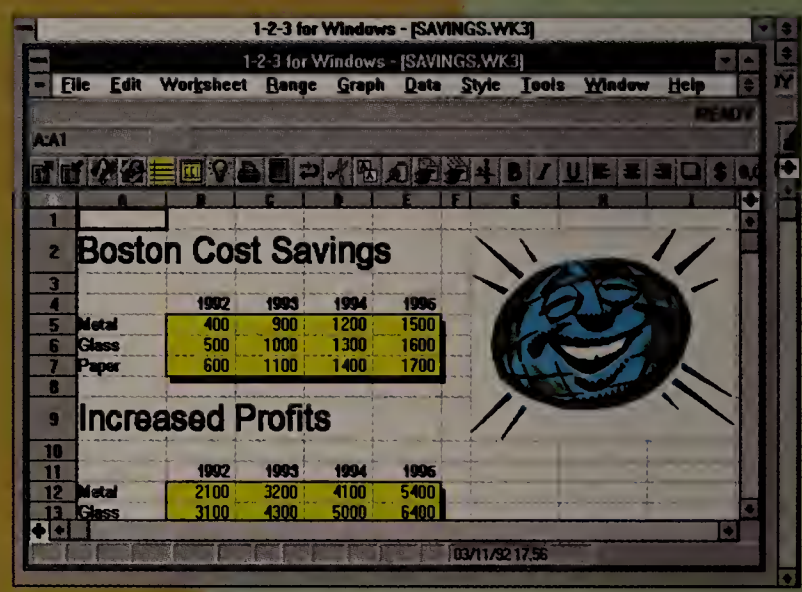

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Optiquest 2000D

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Along with the fine 0.28mm dot pitch, the 2000D boasts of Invar Shadow Mask technology. Now you can increase the brilliance and crispness of the image about 20 percent. Packed with features, the Optiquest 2000D even has micro-processor-based digital controls with built-in memory for 124 custom and preset adjustments.

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"... Optiquest 2000D is the overall performance leader."

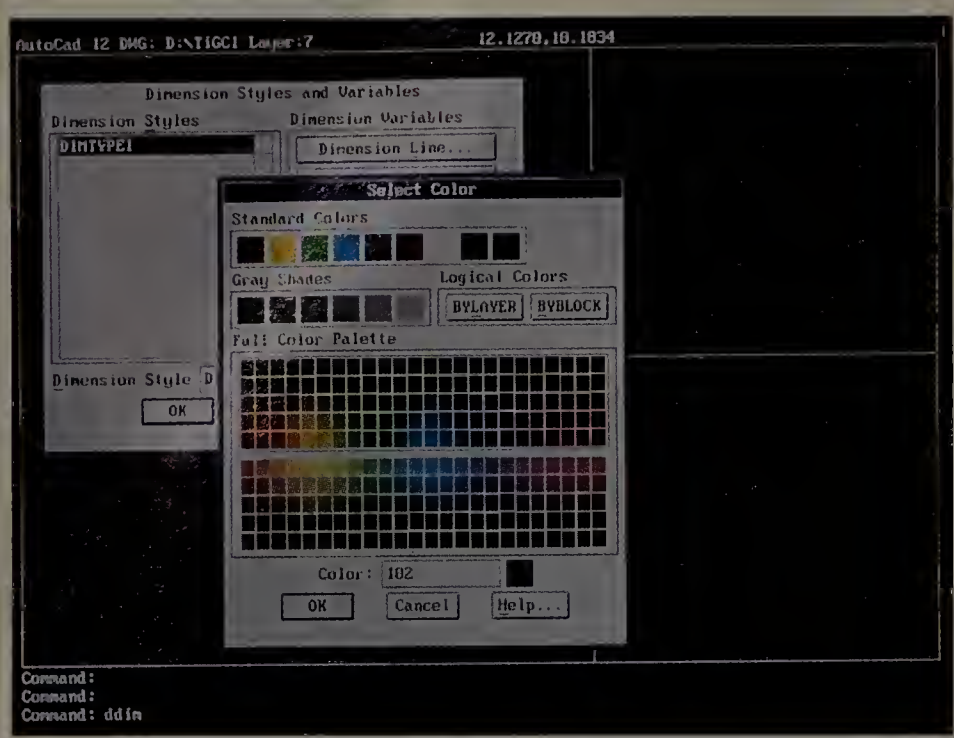
Byte Magazine: May 1992

OPTIQUEST

The Non-interlaced Company

Circle 192 on reader service card

Superman CAD: AutoCAD 12 Starts With a 386



Release 12's new graphical interface flattens AutoCAD's steep learning curve, and shading is now an integral part of the program.

With *AutoCAD 12*, the leading CAD package escapes the restraints of low-end hardware and leaps ahead in features, speed, and ease of use. While the fine-tuned release 12 is 10 to 60 times faster than its predecessor, it requires some equally impressive hardware to perform its best: Try starting with at least a 386 equipped with 8MB of RAM and 11MB of free disk space. Then buckle your seat belt. In a demonstration of beta software running on a 33-MHz 486, we watched release 12 zoom in on a drawing of planet Earth to show a small town in Northern California, with no perceptible delay to regenerate the drawing.

The new graphical interface of release 12 incorporates pulldown and pop-up menus. The latter can appear anywhere on screen, as can icon buttons and customizable dialog boxes. You can continue to use the time-honored keyboard commands.

AutoShade, which automatically shades objects based on a user-selectable light source, is on a pulldown menu in the program and is included in the price. And region modeling is integral to *AutoCAD 12*. You can do geometry by cutting out shapes and add or subtract from shapes using operations similar to those found in the Advanced Modeling Extension (AME) of release 11. *AutoCAD* now supports PostScript.

If you work on a network, you'll be doubly pleased with release 12. It stores multiple plotter and printer configurations, so you don't have to reconfigure every time you use a different device. Release 12 is two-way compatible with release 11, so colleagues will be able to read your release 12 files. And you can lock layers of a drawing so that as it gets passed around the network, nothing can be changed accidentally.

Unfortunately, as of press time this release did not run on OS/2 2.0. And *AutoCAD* has some problems running under *Windows*. It doesn't support *3.0*, and even with *3.1*, unless you use the Null display driver, *AutoCAD* appears only as a full-screen DOS application. Running extended resolution DOS applications within *Windows* can also cause conflicts with video drivers.

AutoCAD release 12 costs $3750; users of releases 1 through 11 can upgrade for $500 until October.

—*Christina Wood*

IN BRIEF

AutoCAD 12

AutoCAD release 12 adds speed, integrated shading, and a graphical interface. The price tag is $3750, but upgrades from releases 1 through 11 are $500.

Autodesk, Inc.
2320 Marinship Way
Sausalito, CA 94965
800/445-5415,
415/332-2344
Reader service no. 719

Baler's Fast 1-2-3 Templates

Here's a way to save your company scads of money on software if you're designing and distributing *1-2-3* templates. With *Baler 6.0*, you can compile your WK1 format worksheet models for use as stand-alone applications—and distribute unlimited royalty-free copies. A "Baled" worksheet works almost identically to the same worksheet loaded into a spreadsheet program and provides access to the familiar *1-2-3 2.3* menu.

The $495 product's new features include high-quality printed output, compatibility with *1-2-3 2.3* macros, mouse support, enhanced graphs, and the capability to read the first page of a *1-2-3 3.*x worksheet.

Dozens of customization options can make compiled worksheets look better than those running under *1-2-3*. You can build dialog boxes and pulldown menu systems and customize colors to the max—thanks to 122 macro commands (22 of them new to this version). *Baler* uses more memory than *1-2-3*, so large worksheets may require expanded memory. Fortunately, the product also provides disk-based virtual memory, so out-of-memory errors will be rare—although using virtual memory can slow things down considerably.

Advanced developers may want to spend $300 more for *BalerXE 2.0*, which includes graph printing, an API for customization with *Microsoft C*, an add-in manager, and the capability to generate smaller executable files.

Baler will pay for itself if you can avoid buying one or two more copies of *1-2-3*. If you use and distribute standardized spreadsheet templates, one of these upgrades has your name on it.

—*John Walkenbach*

IN BRIEF

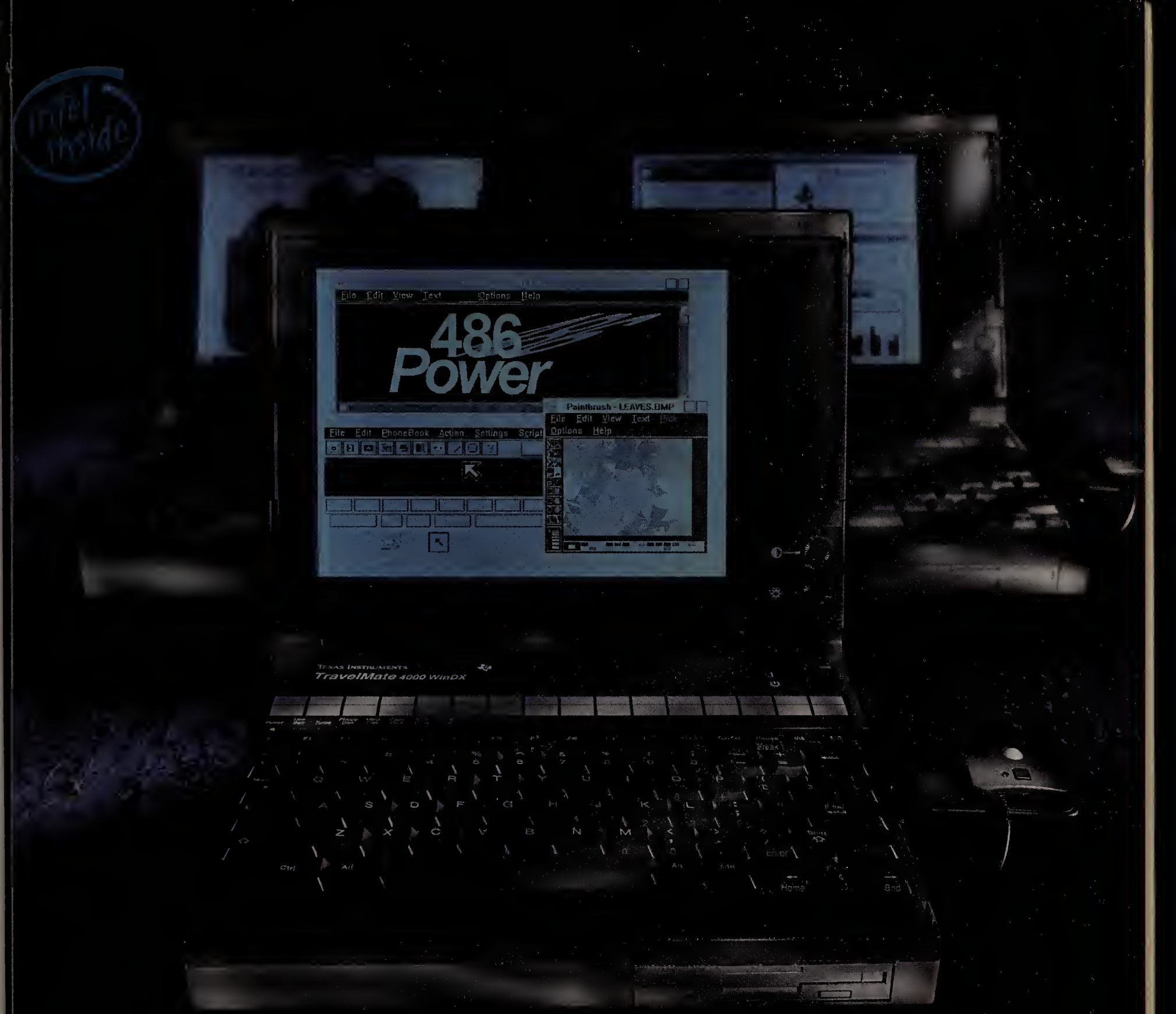
Baler 6.0

This upgraded spreadsheet compiler features high-quality printing, mouse support, dialog boxes, pulldown menus, and 22 new macro commands.

BalerXE 2.0

This version extends the functionality of Baler 6.0 by adding custom menus, a programmer's API, graph printing, and prewritten library routines.

Baler Software Corp.
1400 Hicks Rd.
Rolling Meadows, IL 60008
800/327-6108,
708/506-1808 (fax)
Reader service no. 720



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Choose from three models to meet your needs. They all feature an enhanced 10" diagonal VGA display, plenty of memory and storage, and four to five hours of typical battery life. Plus the new TM4000 notebooks measure only 8.5 x 11 x 1.8" and weigh in at under 5.6 lbs. (including battery). All this at a surprisingly affordable price and with ample performance to take you well into the future.

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80MB HDD	TravelPoint™ pointing device
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*Twice the performance of a 25MHz 386SL™ processor

For more information and the name of a dealer near you, call 1-800-527-3500.

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Circle 278 on reader service card

A Graphical Cure for Mac Envy

CA-Cricket Paint offers a host of sophisticated image tools—including a floating zoom box for fine detail work.

Need to create or edit images for slide presentations or multimedia apps? Don't plunk down your money on a Mac just yet. Computer Associates' $595 *Cricket Paint* combines free-form image-creation tools with sophisticated darkroom controls for editing scanned photos—and it runs under *Windows*.

Paint comes with a full range of brush shapes and color controls. Using these tools, you can smooth jagged edges, mask parts of an image to protect them while painting, and adjust color translucency to create glaze effects. Floating dialog boxes give you access to tools no matter what mode you're in.

Paint handles multiple 24-bit color or 8-bit gray-scale images in TIFF and BMP formats. Built-in JPEG file compression keeps huge color images from swallowing your hard disk.

Users who require color separations or use other file formats will need *CA-Cricket Image*, a $295 utility bundled with *Paint* for a total cost of $695.

Paint requires *Windows 3.0* or *3.1*; a 25-MHz 386 with 4MB RAM and a 256-color display are recommended.

—*Daniel Tynan*

IN BRIEF

CA-Cricket Paint

WINDOWS This sophisticated Windows package gives graphic artists Mac-like tools for manipulating images.

Computer Associates Int'l
One Computer Associates Plaza
Islandia, NY 11788-7000
800/225-5224,
516/342-5329 (fax)
Reader service no. 721

357: An Easy Way to Stay in Touch

While contact managers all do pretty much the same thing—track business contacts, phone numbers, financial information, schedules, and so on—they aren't all as easy to learn and use as *357*. This $99 *Windows* package has a colorful, eye-grabbing interface; large graphical buttons for task selections; and bright, readable text.

357's button-oriented interface is easy to learn but doesn't follow the traditional, menus-and-icons paradigm familiar to *Windows* users. New users may be tempted to click on the icon-size illustrations that describe each button's function, instead of the button itself.

With *357*, you can point and click your way through a variety of tasks. You can plan your daily schedule, create to-do lists, and schedule next month's travel using *357*'s calendar. Or you can dial phone numbers from within the program. Automatic links to word processors and spreadsheets allow you to use your favorite *Windows* programs from within *357*. A network version is under development, according to Valmer officials.

—*Jeff Bertolucci*

IN BRIEF

357

WINDOWS An easy-to-learn contact manager for Windows features large, graphical buttons and a colorful interface.

Valmer, Inc.
299 California Ave. #325
Palo Alto, CA 94306
415/328-1357,
415/328-1369 (fax)
Reader service no. 723

Why Fractal Mathematics Is Important to Images

Image compression ratios of almost 50 to 1 are possible with *Images, Incorporated 1.0*, a new image-compression and -enhancement tool that uses fractal mathematics.

IN BRIEF

Images, Incorporated 1.0

An innovative file-compression and resolution-enhancement program that uses fractal mathematics.

Iterated Systems, Inc.
5550-A Peachtree Pkwy.
Norcross, GA 30092
404/840-0310,
404/840-0806 (fax)
Reader service no. 722

Developed by Iterated Systems, a pioneer in this use of fractals, *Images, Incorporated*, has its own file format, FIF (fractal image format), and can reduce a 192MB image down to 4MB. Though this method of compression loses some data in the process, the quality of the image remains high. And the file can be opened very quickly from within *Images, Inc.*

What's even more fascinating is this program's capability to increase an image's apparent resolution. Normally, the more you enlarge a scanned image, the worse it looks. While antialiasing utilities can remove the jagged edges from enlarged images, *Images, Incorporated* uses fractal projection to add pixels intelligently. This process is very slow, however—up to an hour or more per image, depending on how much you increase size, although 15 minutes is more typical. But the results can be impressive. Fractal-based compression and enhancement have previously been available only through a combination of expensive compression boards and software. *Images, Inc.* significantly reduces the price of this technology.

The manual is terse and inelegant, the installation cumbersome. But if you work with bit maps frequently, you may find this $299 compression and enhancement tool well worth the trouble. —*Christina Wood*

Bitstream Invites You To Take The FaceLift For WordPerfect Challenge.

Just hit 'Ctrl-F8' & bingo, a great-looking WordPerfect document!

Fred H. Hutchison
President
F.H. Hutchison & Co.
Washington, D.C.

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Lori Paolucci
Systems Analyst
Kraft General Foods
White Plains, N.Y.

FaceLift for WordPerfect brought out the creative genius in me.

Kathy Lettenmaier
Sr. Records Clerk, AT&T
Basking Ridge, N.J.

I'M CONVINCED!

Boyd Savage
System Administrator
Roberts & DiPaola, P.A.
West Palm Beach, Florida

I Had No Idea My Dot Matrix Printer Could Pump Out Type Like This.

KENNETH ARNOLD
CONSULTANT
KINDRED SYSTEMS
TUCSON, AZ

Lately, it seems like almost every WordPerfect® user is creating terrific-looking documents in seconds with FaceLift™ 1.5 for WordPerfect.

After all, who'd resist a utility that gives you 16 award-winning Bitstream® typefaces in 2-500 point sizes by simply pressing 'Ctrl-F8' in WordPerfect? Who'd pass up the chance to instantly produce top-quality type from almost any LaserJet,® dot matrix or inkjet printer? Who'd miss out on all this, knowing that FaceLift 1.5 for WordPerfect needs just a fraction of your hard disk space, and takes only 10 minutes to install?

If you've read this far, we suspect the answer is ***you.***

Then take the FaceLift for WordPerfect Challenge. Try FaceLift 1.5 for WordPerfect for 30 days. See how easy it is to make your documents look outstanding. If you're not completely satisfied, return it for a refund. You risk nothing.

You'll get these 16 Bitstream typefaces:

Swiss™ 721 Roman
Swiss 721 Italic
Swiss 721 Bold
Swiss 721 Bold Italic

Dutch™ 801 Roman
Dutch 801 Italic
Dutch 801 Bold
Dutch 801 Bold Italic

Monospace 821

Bitstream Cooper Black

Formal Script 421

Park Avenue™

Brush Script™

188 ITC Zapf Dingbats®
☆✂☎✉✓☛✗✐➪❶②❦✆

150 Symbols Monospaced
ΑΒΧΔΕΦΓαβχδεφγ123⊕ΥΩ

150 Symbols Proportional
ΑΒΧΔΕΦΓαβχδεφγ123⊕ΥΩ

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Bitstream Inc.
Attn: Sales/Free Offer
215 First Street
Cambridge, MA 02142

"FaceLift's output was the most impressive of all (font) packages tested..."
PC Week 8/26/91

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$99
Suggested U.S. Retail

Bitstream

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Circle 41 on reader service card

Stay in Sync With FileRunner

If you work on multiple computers, keeping your files in sync can be maddening. Many users employ serial cables or floppy disks with complex batch files to transfer files between computers. But now there's *FileRunner*, a slick utility that takes the drudgery out of file transfers and updates. *FileRunner* automatically monitors new, modified, and deleted files on as many as 15 computers, safeguarding you against losing versions if you go out of sync.

```
FileRunner(tm)                    PC World: Tips, Home, UG, PO

Operational Status:
                    Transferring files from B: to D:

Statistics:
Runner file specifications........ 18   | On B: and not on D:............... 16
Runner files on B:................ 125  | Later files on B:................. 0
Runner files on D:................ 120  | On D: and not on B:............... 11
Free space on D: (bytes).... 14090240  | Later files on D:................. 1
0526 size (bytes). ............146341   | Transferring................1 of 16

Messages:
0526 from GLEN CANYON is on B:
This file was created on GLEN CANYON.
Press T to Transfer to D:\WOOD\ on this PC.
Press D to Delete from B:
Press I to Ignore file transfer at this time.
Press A to transfer All 16 file(s) without confirmation on each file.

          Press T, D, I or A-

                F1-Help      ESC-Exit
```

FileRunner keeps track of and updates the latest version of your files on all your computers, from laptop to desktop.

Installing *FileRunner* is easy: Name the computer you're installing it on, tag the subdirectories you use often, and verify the system time and date. Once configured, *FileRunner* creates a floppy disk to hold files, file-update status, and information about each computer. You're prompted throughout the transfer process, and the version control feature ensures that only the latest version of any file can reside on each computer in a multiple-computer environment. *FileRunner* also protects you against overwriting different versions of the same file. The program monitors up to 200 files on a disk and can compress files for increased storage.

FileRunner is easy to use and intuitive—you probably won't even need the manual—and offers some surprisingly sophisticated features. For example, the program keeps track of time zones and adjusts for daylight saving time so files are synchronized even if your desktop is on the west coast and you're using your laptop in New York. *FileRunner* also detects viruses using Microcom's *Virex for the PC* but unfortunately doesn't eliminate them. The $99.95 program includes some basic file-management utilities.

—*Steve Bass*

IN BRIEF

FileRunner

This slick utility keeps track of—and updates—the latest versions of your files on up to 15 computers.

MBS Technologies, Inc.
4017 Washington Rd.
#4000
McMurray, PA 15317
800/860-8700,
412/941-9076
Reader service no. 724

No-Frills Word Processing

If you like your software plain, the folks at MySoftware will be happy to accommodate you, at a price even the most recession-bitten PC user can afford.

The newest product in the MySoftware line is *MyQuickWriter*, a no-frills word processor that lets you write business letters in a jiffy.

The product is a basic DOS word processor that includes pulldown menus, editing functions such as cut and paste, margin and tab formatting, search and replace, a spelling checker, and page numbering.

You also get dozens of prewritten business letters that you can edit, plus envelope addressing to spare you from typing your return address more than once. Also included is a fax form that lets you enter "send to" information and a message and automatically enters your return address.

MySoftware makes several other basic packages, including *MyDataBase* and programs for invoicing, mailing lists, and expense management. You can find these products in most retail stores that sell software—including WalMart. At $24.95, *MyQuickWriter* would be cheap at twice the price.

—*Bronwyn Fryer*

IN BRIEF

MyQuickWriter

This no-frills word processor gives you basic text editing and ready-to-go business letters and forms.

MySoftware Co.
1259 El Camino Real #167
Menlo Park, CA 94025
800/325-3508,
415/325-9372
Reader service no. 725

Buerg Enhances List, Goes Retail

Viewing a file is a quick and easy process, right? Not necessarily, especially if you use DOS's TYPE command. But with *List*, a highly successful shareware program that's now commercial, you can produce full-screen displays of a wide variety of file types, including those using a mainframe's EBCDIC language.

File viewing is the tip of the iceberg. *List* also lets you view, print, add, and extract files from archived files such as *PKZIP*, ARC and LHARC. You can open multiple windows for split-screen viewing, search for text in one or more files, print marked blocks or copy them to other files, and view files as large as 32MB. And if you have a modem, you can dial on-screen phone numbers for standard voice calls.

List's point-and-shoot interface offers all the standard file management tools plus Sweep, a handy feature that executes a program on all tagged files. Most of *List*'s functional parameters and operating defaults are easy to customize. *List* is network compatible, takes less than 40K of disk space, and costs $99. —*Steve Bass*

IN BRIEF

List Enhanced

This nifty utility includes powerful file viewing capabilities plus extensive file management tools.

Buerg Software and Computers
850 Petaluma Blvd. N
Petaluma, CA 94952
707/769-5478,
707/769-5479 (fax),
707/778-8944 (BBS)
Reader service no. 726

Get a hold of the best value in LAN power protection

Now just $139! suggested list price

Blackouts, brownouts, sags... Your data and hardware are vulnerable to problems that surge suppressors and power directors are just not equipped to handle.

Now there's a complete Uninterruptible Power Supply solution to suit any budget. The Back-UPS™ 250 is reliable protection for LAN nodes, 386SX machines, 286, small PS/2 systems, and internetworking hardware such as routers, bridges, gateways and repeaters.

From the largest server to the smallest router, the Back-UPS Series will increase your productivity by providing a cost-effective solution to power problems. Call for your free power protection handbook.

The **Back-UPS 250** offers even more cost-effective protection for LAN nodes (typical runtime for a 386SX system is 10 minutes).

NEW!

Guaranteed ABSOLUTE™ Protection

- ABSOLUTE™ Protection guarantees repair or replacement of equipment damaged by a surge while protected by a properly installed Back-UPS (Consult APC for details)
- UL, CSA and Novell approved with a 2 year warranty
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- Most models include LAN interface for automatic-shutdown of Novell, LAN Manager, LAN Server, LANtastic, Banyan, SCO Unix, and others
- Ask about PowerChute® UPS monitoring software and Novell compatible UPS monitoring boards
- 230V models available

LAN TIMES READERS CHOICE 1992

Computer Reseller News Editors' Choice

1991, 1990

Model	Application	List	New List
Back-UPS 250	LAN nodes, 386SX, 286, internet hardware, POS	~~$169~~	$139
Back-UPS 400	Desktop 386, 486 systems, 286 servers	~~$249~~	$229
Back-UPS 450	Tower 386, 486 systems, servers	~~$329~~	$279
Back-UPS 600	Heavily configured systems, CAD/CAM workstations	~~$449~~	$399
Back-UPS 900	Multiple systems, longer runtime applications		$599
Back-UPS 1250	Multiple systems, LAN hubs, small minis, telecom equipment		$799

NEW!
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by American Power Conversion

(800)800-4APC, Dpt. P3

APC 132 Fairgrounds Road, West Kingston, RI (401)789-5735

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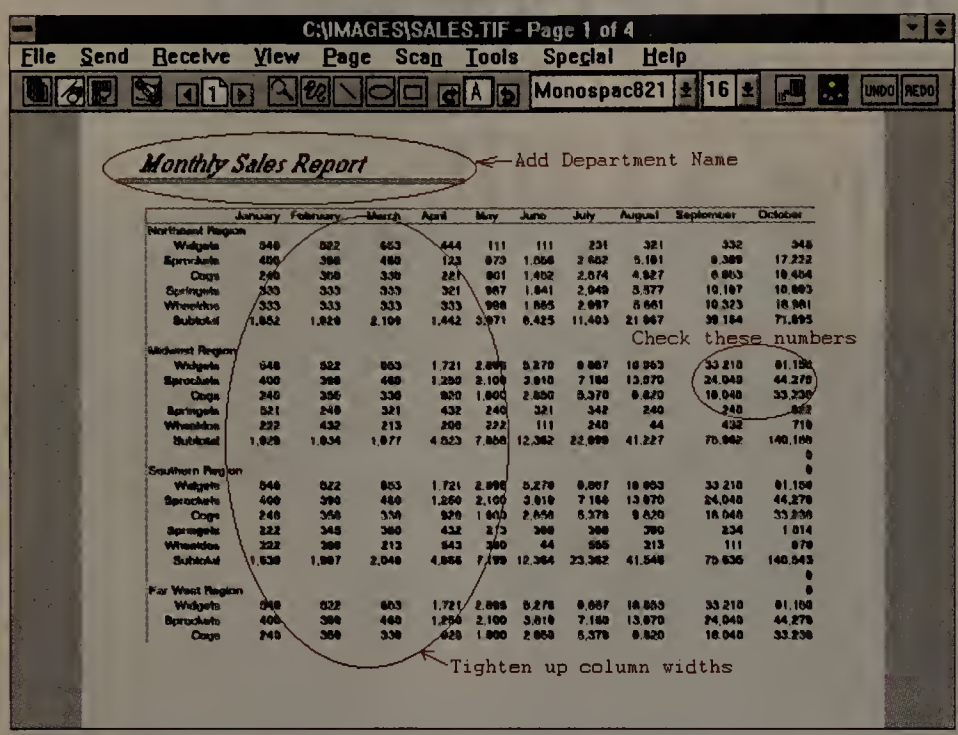
APC Europe TEL :(+33)1.64.62.59.00
FAX:(+33)1.60.17.80.29

Circle 45 on reader service card

Eclipse Expands Fax Software

Eclipse Fax lets you draw and write on faxes without resorting to OCR, adding a new level of sophistication to Windows fax software.



With Eclipse Fax, you can draw lines, boxes, and circles, and even write on incoming faxes without using OCR—and scanner support is built in.

Fax programs make it easy to send and receive faxes from within *Windows*. Now Eclipse Systems is building a new level of sophistication into PC-based faxing with *Eclipse Fax*, a *Windows* program that adds basic desktop publishing features and scanner support to fax software.

Priced at $119, *Eclipse Fax* offers a host of image-manipulation tools. With a mouse, you can draw lines, boxes, circles, arrows, and freehand images on incoming faxes—circle the salient points of a business proposal, for example, or draw lines through a sentence you think should be deleted.

Want to write comments in the margins? Use *Eclipse Fax*'s WYSIWYG editing tools to type directly on your faxes in *Windows* fonts. You can also rotate text to different angles on the page.

As in many other *Windows* programs, a handy tool bar makes it easy to point and click on frequently used functions. Icons let you quickly rotate upside-down faxes and zoom in—up to 48 times magnification—for a closer look.

Another big plus is built-in scanner support, which saves you from having to load a separate program to scan in documents and photographs. *Eclipse Fax* works with Hewlett-Packard's ScanJet as well as with scanners from The Complete PC, Fujitsu, Microtek, and other vendors.

For professional-looking faxes, use *Eclipse Fax* to scan in your company letterhead, logo, or other graphics—no desktop publishing or graphics software needed. You can use Bitstream *FaceLift*, *Adobe Type Manager*, and TrueType fonts, too. *Eclipse Fax* makes referencing easier with 50-character descriptors that simplify document management. Search for clients using criteria such as a company name or a name in your personalized phonebook.

Unlike other popular fax programs, *Eclipse Fax* lacks the OCR technology needed to convert incoming faxes into editable text. However, OCR will be added to an upgrade scheduled for fall release. And while *Eclipse Fax* may not offer every fax software feature imaginable, its impressive collection of image-editing tools—particularly the capability to type on incoming faxes—is duplicated by few competitive products. —*Jeff Bertolucci*

IN BRIEF

Eclipse Fax

WINDOWS A Windows fax program offers a variety of image-manipulation tools to edit fax images.

Eclipse Systems
33 W. Monroe St. #1121
Chicago, IL 60603
800/452-0120,
312/541-0260
Reader service no. 727

Zoom Telephonics Adds Line-Sharing Modems

Capitalizing on advances in phone technology, modem maker Zoom Telephonics is adding four line-sharing fax-modems to its product line. With street prices ranging from about $150 to $400, these modems utilize the "distinctive ring" service offered by regional phone companies to route incoming fax, data, and voice calls.

When you buy the distinctive ring service (it costs about $5 per month), the phone company puts three phone numbers on your phone line. Depending on the number called, the line rings with a different cadence.

Using the DOS software bundled with each Zoom Telephonics line-sharing modem, you assign the different phone numbers to receive incoming fax, data, and voice calls. When you receive a call, the Zoom modem detects the cadence and routes the call to your modem (to receive incoming data), fax (to receive an incoming fax), or voice line (the phone rings until you or your answering machine picks up).

Zoom's four line-sharing modems support the V.42bis and MNP 2 through MNP 5 protocols for improved error correction and data compression. The internal FCV modem, listed at $214, offers 2400-bps data and 9600-bps fax capabilities, while the external FXV model has the same features for $244. The pricier internal VFP ($394) and external VFX ($464) modems support the V.32bis protocol and transmit faxes and data at up to 14.4 kbps. You can use your Zoom modem with software that supports its distinctive ring. —*Jeff Bertolucci*

IN BRIEF

FCV, FXV, VFP, VFX fax-modems

Four line-sharing modems use "distinctive ring" technology to route incoming calls.

Zoom Telephonics
207 South St.
Boston, MA 02111
800/666-6191,
617/423-9231 (fax)
Reader service no. 728

Introducing Quattro Pro 4.0 The only DOS spreadsheet with pushbutton power!

Borland does it again– Sorry, Lotus!

No other DOS spreadsheet gets your work done faster than Borland's new Quattro® Pro 4.0 with pushbutton power!

Quattro Pro beats 1-2-3 . . . again!

New	Quattro Pro 4.0	Lotus 1-2-3 R 2.3	Lotus 1-2-3 R 3.1+
Most Powerful	**Yes**		
Intelligent Graphs	Yes	No	No
Novell Network optimized	Yes	No	No
Multiple sheets	Yes	No	Yes
Multi-variable solver	Yes	No	*
Easiest to Use	**Yes**		
SpeedBar	Yes	No	No
Print-To-Fit	Yes	*	*
Read Lotus 1-2-3 files, styles & macros	Yes	Yes	Yes
Best Performance	**Yes**		
All features in 640K	Yes	?	No
Price	**$495**	**$495**	**$595**

? Yes, but almost no room remains for data.
*Yes, but requires attaching an add-in.

NEW SpeedBar

Quattro Pro's customizable, built-in SpeedBar™ is a row of clearly labeled buttons that use simple English commands to give you instant mouse-click access to your frequently used features and macros.

Plus you get immediate access to a host of new features.

NEW Intelligent Graphs

Intelligent Graphs let you perform extended analysis with your graphs without changing your data. And Quattro Pro's Optimizer™ allows you to solve complex problems using multiple variables.

NEW Novell Support

The best spreadsheet on networks

Only Quattro Pro 4.0 gives you superior Novell NetWare support, including automatic logon, drive mapping and a new Print Queue Manager.

The most feature-packed DOS spreadsheet ever!

And in addition to Quattro Pro 4.0's dramatic new advances, you get the features that have made it the #1-rated spreadsheet in the world. Features such as WYSIWYG, Print-To-Fit™ spreadsheet output, superb 1-2-3® compatibility (you can even read Allways, Impress and WYSIWYG files) and more.

Top-rated spreadsheet Top-rated company

Quattro Pro has won more awards for technical excellence and customer satisfaction than any other DOS spreadsheet. In fact, in the prestigious J.D. Power and Associates® survey, Borland was ranked #1 (tied) for Application Software Publisher in Customer Satisfaction Among Business Users.[1]

Now you know why more than one million people have upgraded to the power of today's spreadsheet. Quattro Pro.

Attention 1-2-3 users!
Step up now!
Special Upgrade offer
See your dealer today or call now,
1-800-331-0877,Dept.5717

BORLAND
Software Craftsmanship

[1] J.D. Power and Associates 1991 Computer End User Satisfaction Study: Phase IV: Business End User Summary. Responses from 4,396 business sites. Copyright © 1992 Borland International, Inc. All rights reserved. All Borland products are trademarks of Borland International, Inc. Pricing is in U.S. dollars. Offer good in U.S. and Canada only. Dealer prices may vary. BI 1471B

Circle 13 on reader service card

If You Need Speed, Turn to 14.4-kbps Modems

U.S. Robotics' Sportster 14,400 fax-modem moves data over phone lines at least 50 percent faster than 9600-bps models.

Speed may kill on the highway, but it sure is a lifesaver when it comes to data transfer. You'll grow gray waiting for Ma Bell or her babies to roll back phone rates. Instead, cut your on-line charges drastically by moving up to a new 14,400-bps fax-modem like the Hayes Optima 144 + Fax144 or U.S. Robotics' diminutive Sportster 14,400 Fax.

Last year about this time, a 9600-bps modem without a fax would have cost you around $1000. Today the suggested retail price for the 50 percent faster Sportster 14,400 Fax is $549, and the Hayes Optima 144 + Fax144 is only $519. You can probably find these external fax-modems on the street for about $350.

You're guaranteed to spend one-third less time sending data over phone lines with one of these 14.4-kbps modems. Depending upon the quality of the line, you may be able to send data files four times faster than before at an effective rate of 57,600 bps, thanks to the V.42 and V.42bis data compression/error correction protocols.

Both units provide facilities for automatic fallback to slower speeds, ensuring error-free transmission. Sportster faxes travel at the familiar Group III rate of 9600 bps, but Hayes' Optima 144 + Fax144 boosts that to the CCITT maximum of 14,400 bps for destinations with similarly equipped fax-modems.

U.S. Robotics' Sportster bundles Blast Fax PC software, while Hayes throws in Smartcom Fax. Both operate as DOS-based TSRs to let you send and receive faxes in the background from any application. They log incoming and outgoing faxes and include phone books for auto-dialing, broadcasting to multiple recipients, or sending multiple faxes in one session. You can schedule faxes for late-night transmissions when telephone rates are lower, and retain your document's formatting even when sending to a stand-alone fax machine.

Both programs give you on-screen notification of an incoming fax, but unfortunately, neither program can distinguish between voice and data. As a result, when the phone rings, you have to pick it up to find out whether your caller is a fellow human being or a machine transmitting data. Hayes's Optima 144 + Fax144 also comes bundled with the *Smartcom EZ* data communications package.

All in all, both of these products offer a cheaper way than yesteryear's to save time as well as money. —*Mike Hogan*

IN BRIEF

Sportster 14,400 Fax

The highest-speed data transfers with fax thrown in.

U.S. Robotics, Inc.
800/342-5877,
708/982-5001
Reader service no. 729

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Hayes Microcomputer Products, Inc.
P.O. Box 105203
Atlanta, GA 30348
404/441-1617,
404/441-1213 (fax)
Reader service no. 730

Fax From DOS With Delrina

DOS users who envy the simplicity and integration of fax software under *Windows* can now have the next best thing.

Delrina Technology has brought many of the capabilities—as well as the graphical look and feel—of its popular *WinFax Pro* software to character-mode DOS. *DosFax Pro,* released in June for a list price of $79, is a TSR program that enables users to fax documents from within any DOS application by simply rerouting printer output to a fax-modem for transmission.

The software works with both text- and graphics-based DOS applications and provides a keyboard- and mouse-driven interface. It works with any fax-modem that uses the Sierra Sendfax Class I or Class II chip set.

Like its *Windows* predecessor, *DosFax Pro* sports a variety of features for automating fax transmission and receipt. The program includes a scheduler for sending faxes at preset times or dates and a dialing directory that lets you transmit faxes to multiple recipients simultaneously. You can attach documents from different DOS applications in a single transmission and customize fax cover sheets with graphics and text; fax headers include a range of variables such as date, time, and page number.

Status logs maintain a variety of statistics for incoming and outgoing faxes, including date, time, duration of transmission, and number of errors and retries. You can select whether to receive faxes in the background so that you can continue working without disruption, or opt to have faxes sent directly to your printer. You can rotate faxes and zoom in on them using a graphical viewer.

DosFax Pro uses the same status logs, phone books, and image file formats as *WinFax Pro,* so users in mixed DOS and *Windows* environments can share data. Migrating to the *Windows* program should be relatively simple.

—*Rob Garretson*

IN BRIEF

DosFax Pro

This DOS version of the popular Windows fax program offers most of the features and the graphical look and feel of the original.

Delrina Technology, Inc.
6830 Via Del Oro #240
San Jose, CA 95119
800/268-6082,
408/363-2345
Reader service no. 731

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intel inside ™

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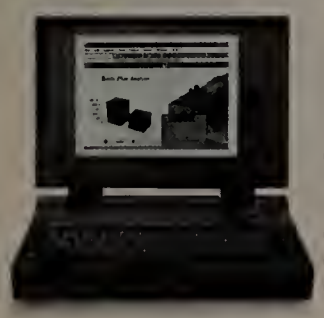

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Circle 69 on reader service card

Lotus SmartPics

SmartPics is a collection of more than 2000 pieces of clip art—a comprehensive storeroom of illustrations that you can use in presentations, documents, or just about any *Windows* application. The artwork falls into 38 general categories, including business professionals, medical scenes and illustrations, page backgrounds, and sports metaphors. Finding the right piece of art is easy with the browser, QuickPic, which provides thumbnail views for quick identification. *SmartPics* requires 11.5MB of hard disk space. Single copies list for $195 or $49 per network node. Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142; 800/343-5414, 617/577-8500.

Reader service no. 732

Quicktel 9624LP Pocket/Fax Modem

Logicode Technology has introduced a $219 pocket fax-modem that runs off the telephone line and serial port. The new 9624LP, an external version of Logicode's Quicktel Xeba modem, contains a small internal battery that provides the power to establish a phone connection. The modem then draws power from the phone line and the serial port, and the internal battery recharges during the connection. The modem transmits data at 2400 bps, sends faxes at 9600 bps, and receives them at 4800 bps. It supports V.42 error correction and V.42bis data compression. The modem measures 4½ by 2¼ by 1⅙ inches and weighs 8 ounces. *Quick Link II* fax communications software is bundled with the modem. Logicode Technology, 1817 DeHavilland Dr., Newbury Park, CA 91320; 805/499-4443.

Reader service no. 733

BitFax/OCR for Windows

WINDOWS Bit Software has teamed up with Caere Corporation to introduce *BitFax/OCR for Windows*, a fax communications package that converts incoming faxes into editable text.

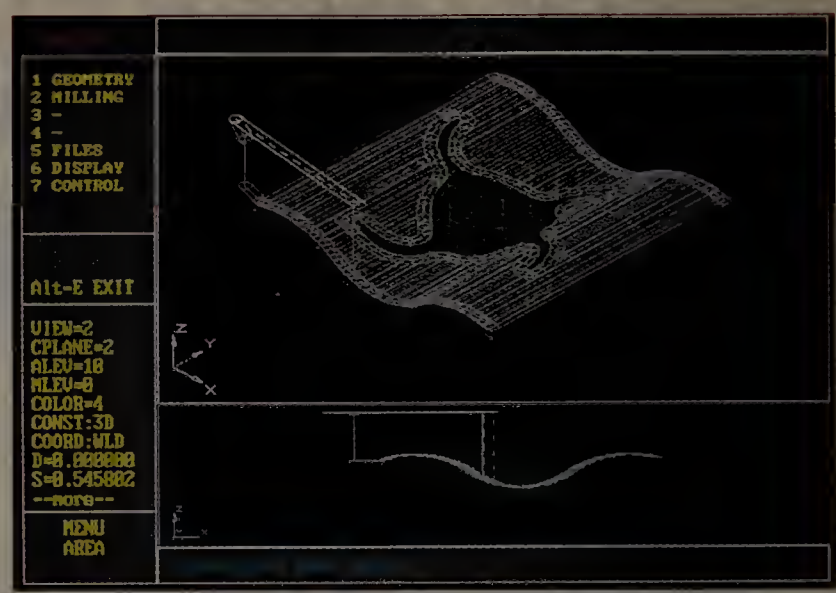
Featuring Caere's *Anyfont* optical character recognition technology, *BitFax/OCR for Windows* has a receive-fax program that loads automatically when you load *Windows*. You can run other *Windows* apps while *BitFax/OCR* receives faxes in the background, and then use *BitFax/OCR* to convert your faxes into word processing or spreadsheet files. Priced at $199, the program runs under *Windows 3.0* on a 386 or higher with at least 4MB of RAM. Bit Software, 47987 Fremont Blvd., Fremont, CA 94538; 510/490-2928, 510/490-9490 (fax).

Reader service no. 734

FaxMania 1.0

WINDOWS Are you tired of boring fax cover sheets? T/Maker's *FaxMania* is an eclectic collection of 80 ready-to-use electronic fax cover sheets for business and home use. Categories include travel itineraries, news releases, and invitations. Many cover sheets feature clip art from T/Maker's *ClickArt* series and come in popular DOS and *Windows* word processing formats: *Microsoft Word, Word for Windows, WordPerfect, WordPerfect for Windows,* and *Ami Pro.* Fill in the recipient's name and fax number in your word processor, then use your fax software and fax-modem to send the cover sheet and fax. Or print your *FaxMania* cover sheet and send it via a conventional fax machine. *FaxMania* costs $39.95. T/Maker, 1390 Villa St., Mountain View, CA 94041; 415/962-0195, 415/962-0201 (fax).

Reader service no. 735



Here CADkey 5 shows the actual path of a milling tool. At the start of a job, you can use the program to simulate manufacturing runs and determine how to create parts.

LightCom 144F

If your desire for the high speed and reliability of a V.32bis modem has been impeded by the high cost of upgrading, now may be the time to cut loose. Lightning Communications has cut the price of its LightCom 144F modem to $279 from $342—one of the lowest prices on the market. The 144F is an internal V.32bis, 14.4-kbps fax-modem that supports V.42, V.42bis, and MNP 2 through MNP 5 protocols for high-speed error correction and data compression. It comes with the *Quick Link II* fax communications program. Lightning Communications, 36 Argonaut #150, Aliso Viejo, CA 92656; 800/433-4420, 714/457-8001.

Reader service no. 736

CADkey 5

CADkey is shipping a computer-aided design package that can be used throughout the design process, from conception to manufacturing. With *CADkey 5,* you can model concepts at the start of a project and see how the finished product will look. Before production, you can simulate stress analysis to, say, determine if a bridge would survive an earthquake, or simulate manufacturing runs to determine how parts will be created. Using the same design for product development and manufacturing can save time and money. *CADkey 5.0* runs on 386/486s and lists for $3495. CADkey, Inc., 4 Griffin Rd. N, Windsor, CT 06095-1511; 800/654-3413, 203/298-8888.

Reader service no. 737

Samsung's Finale 8000 Laser Printer

If you're tired of trying to keep pace with the latest advances in fonts and printer languages, Samsung Electronics America's versatile laser printer may be the ticket. The Finale 8000, Samsung's first nonimpact printer, is based on Intel's i960 RISC processor and has six built-in printer emulations, including PostScript, HP, and Epson. It has automatic switching between emulations and between interfaces, including serial, parallel, and network connections. The printer incorporates 35 PostScript fonts, a TrueType rasterizer for printing *Windows 3.1* fonts, 14 additional bit-map fonts, and 8 additional scalable

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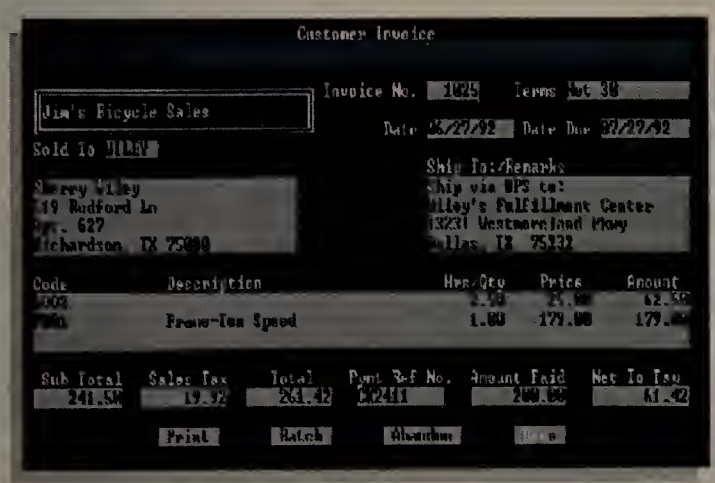
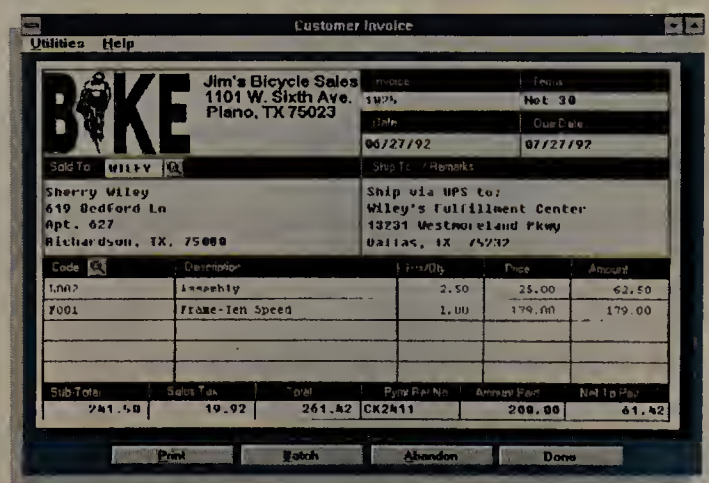


DOS Invoice Screen



Windows Invoice Screen

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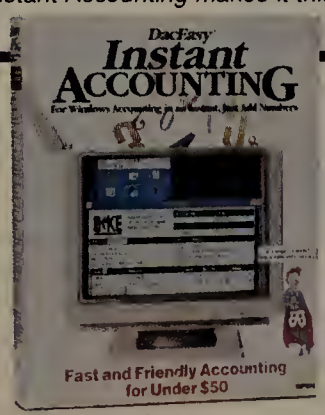

$49.95

IBM or compatible PCs, 512K RAM (1 MB with Windows), a hard disk drive, DOS 3.1 or later, Windows 3.0 or later (optional), monochrome, CGA, EGA and VGA monitors. Mouse optional. Windows is a trademark of Microsoft. DacEasy Instant Accounting is a trademark of DacEasy, Inc. ©Copyright 1992. All rights reserved. DacEasy, Inc., 17950 Preston Rd., Suite 800, Dallas, TX 75252. Media Code: PCW

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Circle 256 on reader service card

Leading Edge joins the multimedia brigade with four 386 PCs, each equipped with a CD ROM drive, stereo speakers, a Media Vision audio card, and super-VGA or better graphics.

fonts. The $1995, 8-ppm laser has a roomy 2MB of RAM (expandable to 10MB), two HP-compatible font cartridge slots, two 250-sheet paper trays, and a 32-bit ISA-compatible upgrade slot. Samsung Electronics America, Information Systems Division, 105 Challenger Rd., Ridgefield Park, NJ 07660-0510; 201/229-4000.

Reader service no. 738

MenuWorks Personal 2.0

After releasing *MenuWorks Advanced* and *MenuWorks Total Security*, PC Dynamics targets the low end with *MenuWorks Personal*, a simplified version of *Advanced* and the replacement for the original *MenuWorks*. Intended for people who want easy access to their programs, *MenuWorks Personal* has 12 templates for setting up the exact style of menu you want. The new *MenuWorks* is faster than the original, recognizes over 1000 programs on your hard disk, and shrinks to a 2K kernel in the background. Like the *Advanced* and *Total Security* versions, *MenuWorks Personal* has a complete set of file-management features. It lists for $39.95, with a $14.95 upgrade available for *MenuWorks* users. PC Dynamics, 31332 Via Colinas #102, Westlake Village, CA 91362; 800/888-1741, 818/889-1741.

Reader service no. 739

Leading Edge Multimedia PCs

The multimedia PC market gains another familiar name with the introduction of a new line of fully configured multimedia machines from Leading Edge. The new line includes four 386s equipped with CD ROM drives, super-VGA or better graphics, Media Vision audio cards, and stereo speakers. The machines comply with the Multimedia PC Marketing Council (MPC) standard. They range from $2399 to $3299 and include a variety of CD ROM–based software. The entry-level 16-MHz 386SX system has 1MB of RAM and a 44MB hard drive. The two SX/20 models are powered by a 20-MHz 386SX and have an 84MB or 130MB hard disk, dual floppy

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Printer Server; buffered from 256 KB to 4 MB ..... start at $295
Expansion Module with Printer Select Switch ..... $149 ea.

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drives, 2MB of RAM, a Sony internal CD ROM drive, an audio card, a mouse, and speakers. The 33-MHz 386DX Multimedia Minitower DX/33 models are similarly configured but have high-resolution VGA and a choice of 2MB or 4MB of RAM and a 130MB or 210MB hard disk. Leading Edge Products, 117 Flanders Rd., Westborough, MA 01581; 800/874-3340, 508/836-4800.
Reader service no. 740

PixoFoto 1.1, PixoFoto Lite

Waiting for *Windows* to load a big color image can be like filling your gas tank with a thimble. Forget about *Windows*. If you need to create and edit color images fast, take a look at *PixoFoto 1.1*. This $895 DOS-based package offers sophisticated painting and darkroom tools without *Windows'* system overhead. *PixoFoto*'s graphical interface lets you edit multiple 24-bit images that can be 8K by 8K in size. You also get advanced prepress features like the capability to set screen angles and create color separations. But you'll need some hefty hardware—a 386 or better with lots of RAM and hard disk space. *PixoFoto Lite*, a leaner version without color separation or support for TARGA or TIGA boards, costs $299. PixoArts Corp., 4600 Bohannon Dr. #220, Menlo Park, CA 94025; 415/323-6592, 415/323-4434 (fax).
Reader service no. 741

Bitstream Typeface Library

High-quality fonts are just a toll-free call away now that Bitstream has made its 1000-plus typeface library available to the public. A single typeface—in Type 1, TrueType, or Bitstream Speedo format—is $32.25, or you can order a mix-and-match family of four for $129. Bitstream will custom-manufacture and ship your fonts. The company is also offering its fonts in retail outlets, with the first 200 fonts arriving in stores in September and the rest available in coming months. A catalog is available from Bitstream. Font four-packs will list for $129, but the street price will be less. Bitstream Inc., 215 First St., Cambridge, MA 02142; 800/237-3335, 617/497-6222.
Reader service no. 742

Flow Charting 3

A new network version of Patton & Patton's *Flow Charting 3* software is useful for anyone who uses a flowchart to demonstrate the course of a project, such as a process diagram, an organization chart, a time flow, or an estate plan. You can assemble a chart template by creating custom shapes, saving them as image files, and then using the product's built-in flowcharting tools to build connections around the shapes. With the network version, *Flow Charting 3 2.10*, you can create your flowchart and share it with others on the network, and others can make changes to the chart. Work groups can log in under a project name, and users can share files simultaneously; but only the person who originally opened the file can save it. The product automatically creates backups of modified or saved charts. Single-user versions are available for $250; five-packs cost $1250. Patton & Patton Software Corp., 485 Cochrane Cir., Morgan Hill, CA 95037; 800/525-0082, 408/778-9972 (fax).
Reader service no. 743

For more information about any product, contact the manufacturer or circle the number on the reader service card.

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The results are final — all those thoroughbred "favorites" outdistanced by a simple, determined, black-and-white cow! And once again, Gateway 2000 leads the pack to bring you new technology at down-on-the-farm prices.

We've incorporated Intel's new 66MHz DX2 clock-doubler chip, the fastest processor available today, in a reliable ISA machine with racing video and disk performance!

It's just one more big winner in our lineup of value-packed, high-performance systems. So give us a call and get in the Gateway 2000 Winner's Circle!

GATEWAY 2000

"You've got a friend in the business."

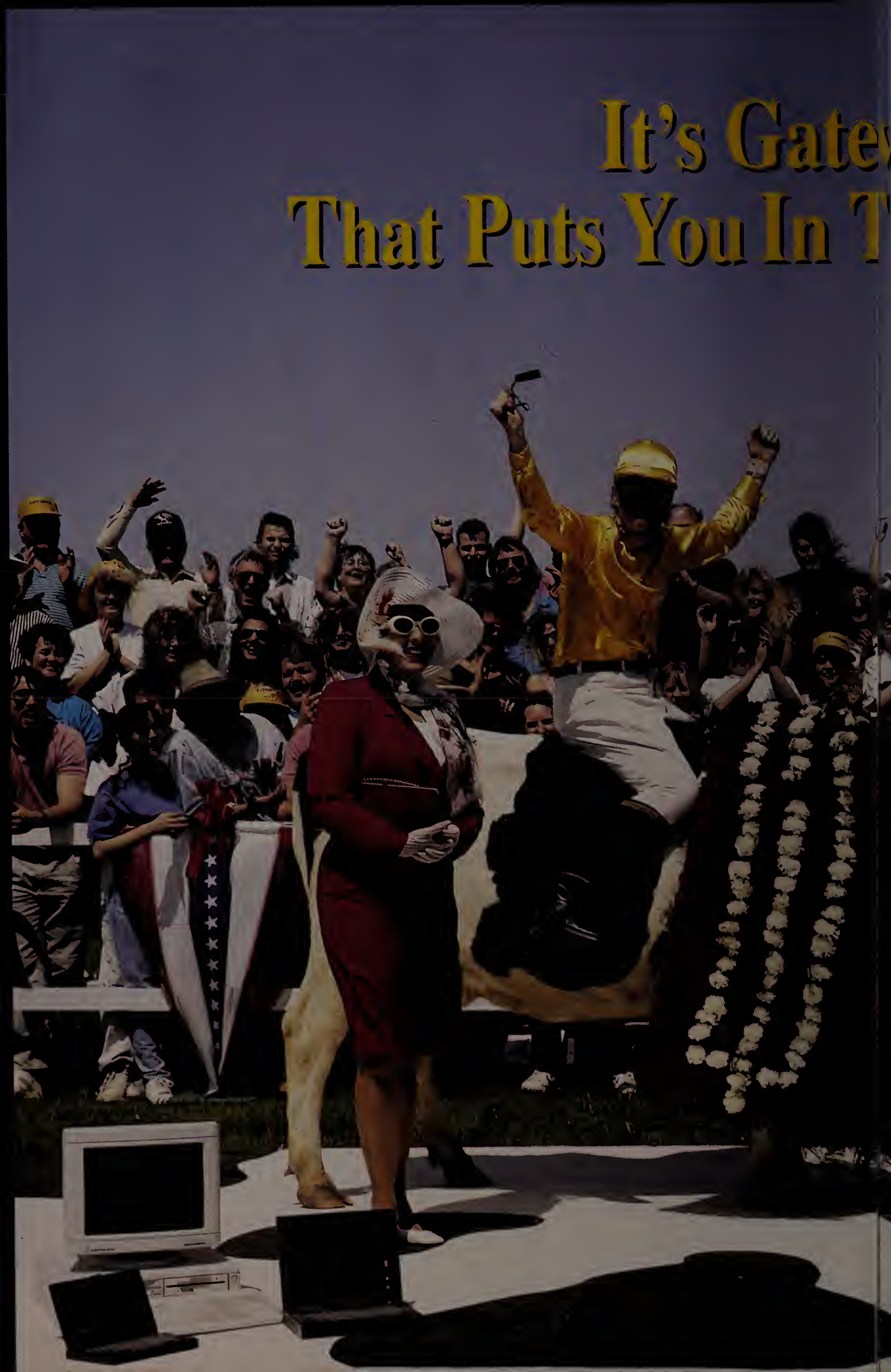
VALUE

486 SYSTEMS

PORTABLES

OPTIONS

It's Gatew
That Puts You In T



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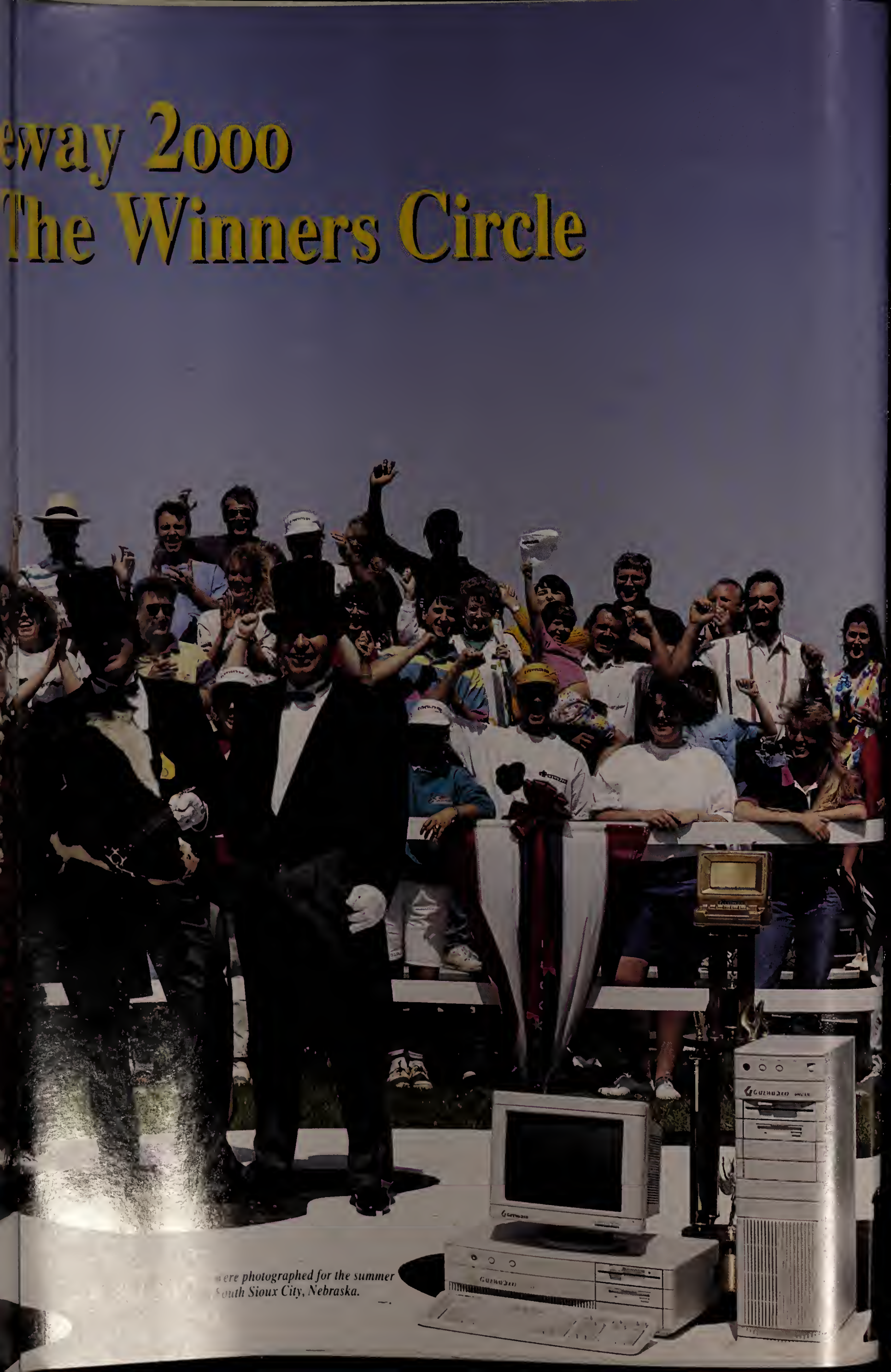
The Winners Circle



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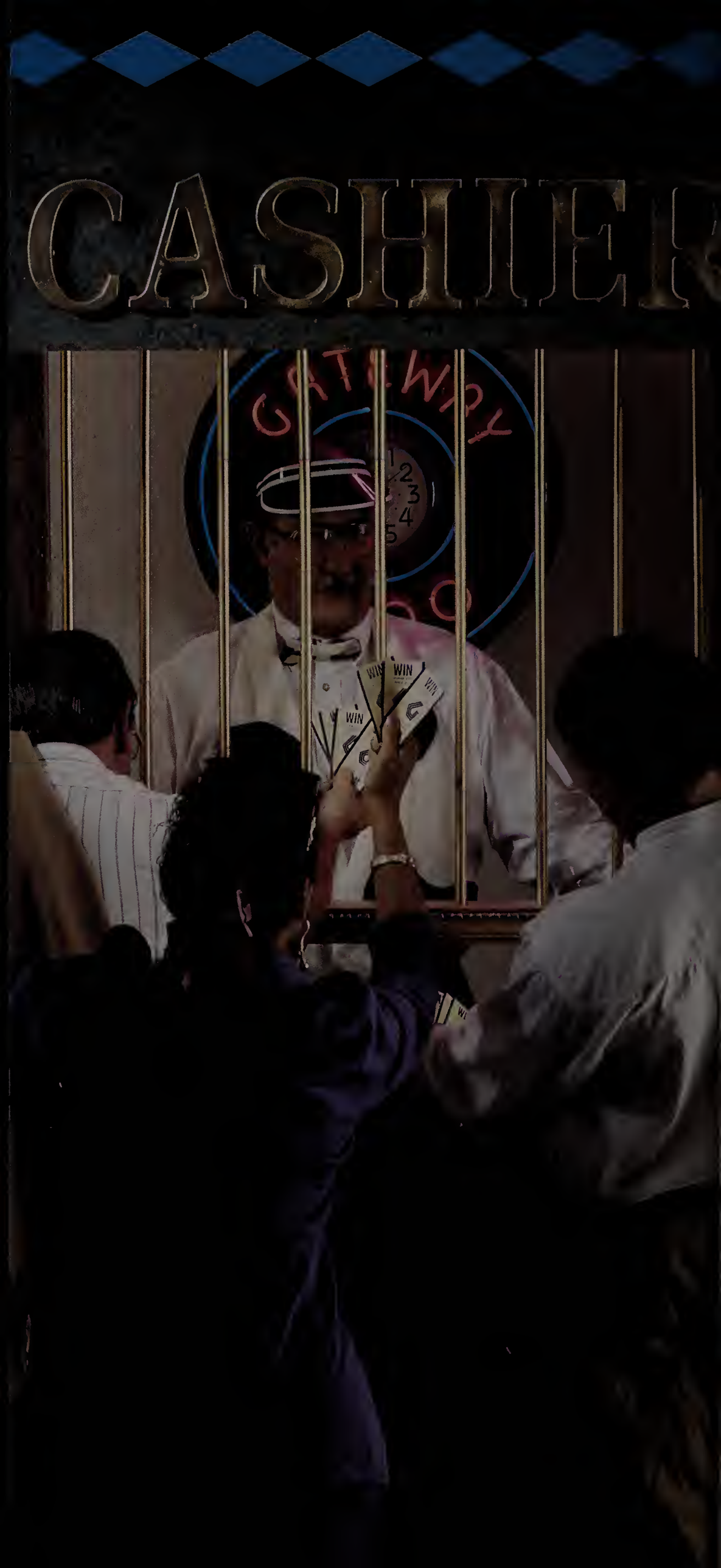
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WIN

Here's A Hot Tip: Gateway 2000 Is A Sure Thing!

VALUE

Before you put your money down, study the statistics on the contenders. The current trend in the PC industry is to cut prices by stripping down systems and replacing quality components with inferior parts. Even companies with long-standing traditions of quality are doing it. At Gateway, we've never lowered our prices in response to market pressures. We've never needed to. And we'll never sacrifice features or quality to make prices look better. Our race strategy has always been to offer the best price, quality and service in the market.

Price

Gateway's price advantage is simple business economics. We have huge volume buying power. The little guys don't. We have low overhead. You don't pay for glass palaces with us. And we operate on conservative margins. While we've grown big and strong on these rations, our margins are a starvation diet for some of our competitors. We lower prices whenever we can. And we've been quietly doing this since day one.

Quality

When surveyed recently by *PC Magazine*, Gateway customers gave their systems the **highest reliability rating** among 35 of the nation's top PC manufacturers. That's certainly an indication that our great prices aren't a trade-off for quality or performance. Gateway systems are loaded with top-of-the-line components and performance features. We know you don't want a cheap computer. You want a great computer at a great price. You want a Gateway!

Service

We know how important service is to you. That's why we're constantly working to provide the best in the business. Service is one of the reasons we received the **highest customer satisfaction rating** in *PC Magazine's* service survey. Gateway scored "significantly better than any other manufacturer" when PC users were asked, "Would you buy again from the same manufacturer?"

Price. Quality. Service. This simple formula still equals the best value in the industry. Add Gateway's ability to bring you the latest technology at the best prices, and you have a triple-crown winner. So put your money on a sure thing. With Gateway 2000, you're guaranteed to come out a winner!

GATEWAY2000

"You've got a friend in the business."

Gain The Winning Edge With 486 Performance

Gateway's powerful 486 models give you the winning margin! And when you recap our new price reductions and compare us feature-for-feature against other runners, you'll find you won't even have to play your hunches — Gateway 2000 is the odds-on favorite.

25MHz 486SX
■ $1895

This is the hottest value on the market! You get 486 technology, including an 8K internal cache and burst mode, at a 386 price. And besides being faster than any 386 on the market, the 486SX/25 is upgradeable to 50MHz if you need increased performance in the future.

33MHz 486DX
■ $2395

We recently increased performance and lowered the price of our best-selling, award-winning 486DX/33 by adding an ATI™ Graphics Ultra video card and a faster, 200MB Western Digital hard drive with 13ms access time. At $2,395, the price/performance ratio on this machine is hard to beat. Plus, you can upgrade this system to 66MHz.

intel inside

50MHz 486DX2

■ **$2695**

Gateway 2000's new 486DX2/50 systems, ISA and EISA, incorporate Intel's speed-doubler technology. The internal core of the DX2 processor executes at 50MHz while communicating with the external memory bus at 25MHz. Our benchmarks show a 35% increase in performance over a 33MHz 486DX.

This system also has the new, faster Western Digital 200MB hard drive and the high-performance ATI Graphics Ultra video card.

50MHz 486DX2 EISA

■ **$3695**

Our EISA system comes standard in a floor-standing tower model, and includes a large, fast SCSI drive and an EISA SCSI controller as standard equipment. RAM cache is expandable to 256K.

66MH 486DX2

■ Call for details.

Gateway 2000 systems come fully configured with all the performance features you want, including two floppy drives, a programmable 124-key AnyKey™ keyboard, a Microsoft® mouse, MS-DOS® 5.0, Windows™ 3.1 and your choice of one application software option. See the back pages of this ad for complete configurations and information about software options, upgrades and peripherals.

GATEWAY 2000

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rules Chicago

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The Nomad Series

Our small, lightweight Nomad notebook computers let you take desktop computer performance anywhere you go. Nomad models come with VGA graphics, a FieldMouse™ (portable pointing device), built-in floppy drive, and an 80 or 120MB hard drive, depending on the model. A patented power-management system gives you hard-to-beat battery life benchmarks — over six hours of operation from a single battery on the 25MHz 486DX system!

The Nomads have a bright, crisp, backlit, 10-inch triple supertwist VGA screen — resolution is 640 x 480, 64 gray scale, on the LCD. With simultaneous video, you can also display on an external monitor.

All these features ... and the Nomads are made in the U.S.A.!

Nomad 325SXL ■ $1995
25MHz, 386SXL processor
■ 4MB RAM ■ 80MB hard drive

Nomad 420SXL ■ $2695
20MHz, Intel® 486SXLP processor
■ 4MB RAM ■ 80MB hard drive

Nomad 425DXL ■ $3495
25MHz, Intel 486DXLP processor
■ 4MB RAM ■ 120MB hard drive

For The Power User On The Go

Nomad Combo ■ $3995

Since the Nomad 425DXL has all the power of a 486DX desktop system, it's the ideal portable/desktop combination system! Save with this combo package!

Combo Highlights: Nomad 425DXL ■ 15" CrystalScan 1572FS color monitor ■ programmable 124-key AnyKey™ keyboard

The HandBook™

If you like to travel light, you can't go wrong with the HandBook. It weighs only 2.75 pounds and measures roughly 6 x 9 inches — smaller than this magazine! Yet it has 286-class performance and real PC features including a bright, backlit screen, a bonafide 40MB hard drive and a comfortable keyboard (no chiclet keys). Downloading information from your HandBook to your office computer is easy with the serial cable and file transfer software provided.

HandBook ■ $1295

For The Executive On The Go

HandBook Combo ■ $3995

Combine the portability of our HandBook with the power of our 33MHz 486 desktop system with communication capabilities — and you have a terrific combo, Gateway value-priced!

Combo Highlights: HandBook with 2,400 bps external modem and communication software ■ 33MHz 486DX system with 120MB IDE hard drive ■ TelePath™ fax/modem package

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"You've got a friend in the business."

GATEWAY 2000 ADDS A FREE SOFTWARE BONUS

Choose Your Free Software Option

With the purchase of any Gateway 2000 mini desktop, desktop or tower computer system, you receive your choice of one application software option at no additional cost. We'll install your software on your hard drive, optimally configured for your system and Windows, and provide master diskettes and manuals. You may also purchase a second application software option, pre-installed, at extremely competitive prices.

Installation and setup errors are responsible for over one-third of all software problems. You can eliminate that possible source of problems by purchasing your system from Gateway with software pre-installed, tested, and ready to run the moment your system arrives. Add that advantage to the hard-to-beat prices, and Gateway is the only logical choice for PCs and software!

Choose one of the following application software options:

Option #1-*Microsoft Excel for Windows™ 4.0*

■ New version of this powerful spreadsheet, includes online help for *Lotus 1-2-3®* users

Option #2-*Microsoft Word for Windows™ 2.0*

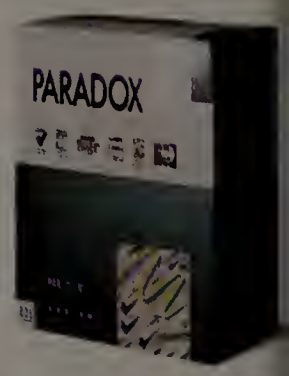
■ Best-selling word processor for Windows. New version 2.0 adds online help for *WordPerfect®* users

Option #3-*Microsoft PowerPoint for Windows™ 3.0*

■ Easy-to-use desktop presentations program creates high-quality overheads and 35mm slides

Option #4-*Borland® Paradox® 4.0*

■ The award-winning database from Borland



Option #5-*The Entrepreneur Pack*

■ Includes the latest Windows versions of *Microsoft Works*™, integrating word processing, spreadsheet, and database in one easy-to-use program; *Microsoft Publisher*,™ for creating page layouts; *Microsoft Money*,™ to help you write checks, set budgets, track expenses; PLUS an *Entertainment Pack* with eight games, including *Tetris®*

Option #6-
The Windows Programmer Pack

■ Includes everything you need to create programs for Windows: *Microsoft QuickC for Windows*™, *Windows Control Development Kit*™, *Windows Help Compiler*™ and *Windows Programmers' Online Reference*™.

Option #7-*Microsoft Project for Windows*™ *3.0*

■ Flexible and easy project management program

NOTE: If you would rather replace an option with *Microsoft Office*™, it is available for $175. This package includes *Word for Windows*, *Excel* and *PowerPoint*.

More Software At A Great Price!

The following applications are only available with the purchase of a system, pre-installed, or to Gateway customers.

Central Point® Anti-Virus 1.2 For Windows ■ $75

Central Point Backup™ 7.2 for Windows ■ $75

The Norton Desktop™ 2.0 and Prisma Your Way 2.0 For Windows ■ $95

These offers include the identical applications contained in retail packages but will not include the retail box. You get all master diskettes and manuals, shrink-wrapped and packaged in a Gateway 2000 box.

Peripherals

The 15-Inch CrystalScan 1572FS

You'll enjoy your new Gateway 2000 computer even more if you choose the new 15-inch CrystalScan color monitor option. The CrytalScan 1572FS has a flat, square, non-glare screen to reduce distortion around the corners and provide edge-to-edge display area.
The CrystalScan 1572FS is an upgrade option only with the purchase of a 386DX or 486 system for an additional $195.

The Gateway 2000 TelePath™ Fax/Modem

The Gateway 2000 TelePath is a 14,400 bps mode, V .32bis, with 9,600 bps fax capability. The TelePath comes with WinFax Pro,™ Crosstalk™ for Windows, Qmodem™ and a free 30-day basic services CompuServe® membership — all for only $195!

■ Fax mode: V.17, V.29 and V.27ter

■ Data mode: V.32bis, V.32, V.22bis, V.22, V.21, Bell 212A and 103, V.42 and MNP 2-4 error correction, V.42 bis/MNP 5 data compression

Included With Every System:

■ One-year limited warranty ■ 30-day money-back guarantee ■ Lifetime toll-free technical support ■ Free on-site service to most locations (*factory service only for notebooks*) ■ Free bulletin board technical support ■ C.O.D. terms and major credit cards honored ■ Net 30-day credit terms and leasing options available to qualified commercial customers

Sorry — we sell peripherals only with the purchase of a Gateway 2000 system, or to people who are already Gateway 2000 customers. For fastest service, call our new direct line for the ***Component Add-On Division: 800-252-3333.*** *Please have your customer ID handy when you call.*

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GATEWAY 2000 WINNERS CIRCLE

PORTABLES

HANDBOOK™

- 286 Class Performance
- 1MB RAM upgradeable to 3MB
- 40MB Hard Drive
- Backlit 7.6" CGA Screen
- Size 5.9" x 9.75" x 1.4", 2.75 Lbs.
- 4.5-Hr.* NiMH Battery & AC Pack
- 1 Parallel/1 Serial Port
- 78-Key Keyboard
- MS DOS 5.0, File Transfer Software & Serial Download Cable
- Introductory Bonus Pack
- Carrying Case

$1295

NOMAD 325SXL

- 25MHz, 386SXL Processor
- 4MB RAM
- 1.44MB 3.5" Drive
- 80MB IDE Hard Drive
- Backlit 10" VGA Screen, 64 Grays
- Simultaneous Video with 256K
- Size 8.5" x 11" x 1.8", 5.8 Lbs.
- 7-Hr.* NiCad Battery & AC Pack
- 1 Parallel/1 Serial Port
- 79-Key Keyboard
- FieldMouse™ Pointing Device
- MS DOS® 5.0 and Windows™ 3.1

$1995

NOMAD 420SXL

- 20MHz, Intel® 486SXLP Processor
- 4MB RAM
- 1.44MB 3.5" Drive
- 80MB IDE Hard Drive
- Backlit 10" VGA Screen, 64 Grays
- Simultaneous Video with 1MB
- Size 8.5" x 11" x 1.8", 5.8 Lbs.
- 6-Hr.* NiCad Battery & AC Pack
- 1 Parallel/1 Serial Port
- 79-Key Keyboard
- FieldMouse Pointing Device
- MS DOS 5.0 and Windows 3.1

$2695

NOMAD 425DXL

- 25MHz, Intel 486DXLP Processor
- 4MB RAM
- 1.44MB 3.5" Drive
- 120MB IDE Hard Drive
- Backlit 10" VGA Screen, 64 Grays
- Simultaneous Video with 1MB
- Size 8.5" x 11" x 1.8", 5.8 Lbs.
- 6-Hr.* NiCad Battery & AC Pack
- 1 Parallel/1 Serial Port
- 79-Key Keyboard
- FieldMouse Pointing Device
- MS DOS 5.0 and Windows 3.1

$3495

DESKTOPS

25MHz 386SX

- Intel 386SX Processor
- 4MB RAM
- 1.2MB & 1.44MB Drives
- 80MB 17ms IDE Cache Drive
- 16-Bit SVGA with 512K
- 14" CrystalScan 1024 Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey™ Keyboard
- Microsoft® Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software

$1495

25MHz 486SX

- Intel 486SX Processor
- 4MB RAM
- 1.2MB & 1.44MB Drives
- 120MB 15ms IDE** Cache Drive
- ATI™ Graphics Ultra Video
- 14" CrystalScan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software

$1895

33MHz 486DX

- Intel 486DX Processor
- 64K Cache RAM
- 4MB RAM
- 1.2MB & 1.44MB Drives
- 200MB 13ms IDE** Cache Drive
- ATI Graphics Ultra Video
- 14" CrystalScan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software

$2395

50MHz 486DX2

- Intel 486DX2 Processor
- 64K Cache RAM
- 8MB RAM
- 1.2MB & 1.44MB Drives
- 200MB 13ms IDE** Cache Drive
- ATI Graphics Ultra Video
- 14" CrystalScan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software

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50MHz 486DX2 EISA

- Intel 486DX2 Processor
- 128K Cache RAM
- 8MB RAM
- 1.2MB & 1.44MB Drives
- 340MB 15ms SCSI Cache Drive
- 32-Bit EISA SCSI Controller
- 16-Bit SVGA with 1MB
- 14" CrystalScan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0 and Windows 3.1
- Choice of Application Software
- Tower Model is Standard

$3695

66MHz 486DX2

- Call for details

** Battery life was measured using* PC Magazine's *Battery Rundown Test with power management enabled. Actual results may vary depending on configuration and applications.*

All prices and configurations are subject to change without notice. Prices do not include shipping. Components, peripherals and software are sold only with the purchase of a system, or to customers who already own Gateway 2000 systems. Some limitations apply.

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Edited by ERIC BENDER

Software Licensing: Still a Jungle

Lack of Standards, Confusing Policies Hamper Legal Use

Managing software licenses is a thankless job. Just ask your friendly-but-overworked network administrator, who must wade through the small print on licensing agreements and monitor software usage to make sure your office isn't running more copies of a program than you've bought.

Don't think it's a big deal whether you're legal? Think again. Vendors have started playing hardball when it comes to software piracy, and a bill winding its way through Congress would make it a felony to reproduce as few as ten copies of a program. On a happier note, as vendors adopt new licensing schemes, you may get a chance to save real money.

Unfortunately, "it is a horrendous job to try to manage licenses today," says Keith Herron, microcomputer manager for Weil, Gotshal, and Manges, a New York law firm. Ultimately, Herron and others would like vendors to devise a simple, one-size-fits-all licensing scheme that would cover any LAN-ready applications.

That's a far cry from today's mess. Currently there is a jungle of policies: licenses for a particular user, a particular machine, or *concurrent* use (on a certain number of networked PCs). Some LAN applications have a built-in locking mechanism that keeps the number of concurrent users at the legal limit. Many do not, however, forcing you to rely on third-party metering programs that add unwanted traffic and administration.

The Software Publishers Association and Microcomputer Managers Association are attacking this problem with a standard interface for metering software licensing in networked applications. Microsoft, Novell, Lotus, WordPerfect, and others say they'll include it in future releases.

For Larry DePriest, information systems manager for the state of Oregon's Economic Development Office in Salem, this effort is a solid first step toward making his job easier. "We use multiple types of metering programs, and a standard would save us quite a bit of time," says DePriest.

However, SPA research director Dave Tremblay emphasizes that the industry is still years away from a standard licensing scheme.

Different Views on Remote Use

Net licensing standards don't settle the issue of whether users can copy software for home and portable PCs. Here, vendor policies are all over the map. Microsoft promotes an "80/20" rule: If a program is installed on a computer, and if you use this computer more than 80 percent of the time, you may also use the program on a portable or home PC. But Claris Corporation of Santa Clara, California, has a different 80/20 rule: You can install an office program on a portable or home PC, but 80 percent of the work must be done at your primary work location.

To complicate matters, not all concurrent networking licenses allow home/portable use—forcing you to study each license agreement before you buy. Generally, if your employees travel extensively and need software on the road, concurrent licenses "don't work so well," notes Jo Haraf, director of office technology for Booz, Allen & Hamilton in Bethesda, Maryland.

Confused? You're not alone. "It's hell," says Carol Meadows, senior systems analyst at Great Western Bank in Los Angeles. Meadows, a former LAN administrator, says she handed out a copy of the software to remote users who work at home—provided the company had signed a suitable site license. "But so few vendors actually give you site licenses," she laments.

One vendor that does give you the option is WordStar Corporation in Novato, California. But WordStar retains a single-CPU policy for its inexpensive writing utilities, which users tend to "share" more frequently—and illegally. "It's the curse of the software industry," says marketing director Alex Hoag. "The temptation to hit the copy button is unbelievable."

—Jeff Bertolucci

Vendors Differ on Licensing Schemes

Network licensing policies of selected major suppliers

Company	Products with special LAN versions	Type of license	Multiuser discount	Portable/ home use
Borland	some	concurrent/ site	30%–60%	yes
Lotus	most	concurrent	up to 19%	not vio LAN version (policy under review)
Microsoft	none	individuol/ concurrent	14%–33%	yes (80/20 rule)
WordPerfect	none	concurrent	41%	yes

Is your office running legal copies of software? Leading application suppliers offer a smorgasbord of licensing policies.

Saving on Concurrent Licenses

List pricing on network licenses for $495 Windows word processors

	Lotus Ami Pro	Microsoft Word for Windows	WordPerfect for Windows
20-user license	$7900	$7900	$5841
10-user concurrent license	$3950	$4950	$3636
Savings	50%	37%	38%

Concurring licensing agreements can reduce software expenditures dramatically. These are list prices; customers typically pay much less after reseller discounts and upgrade offers.

Can AST Stay Ahead of the Pack?

While Compaq Clones Its Strategy, AST Leverages Its Experience

AST Research has seen the enemy, and it looks awfully familiar. It comes as no surprise: Compaq's aggressive PC pricing strategy, launched in June, is deliberately modeled on AST's.

Wall Street, which was already hammering AST's stock, promptly drove its price to new lows. And within two weeks AST took a page from Compaq's book by forcing out a cofounder—Tom Yuen, who had been cochairman and chief operating officer. President Safi Qureshey, the last of the three cofounders, will now lead day-to-day operations and report to a board chaired by an outside director.

With AST's stock in the tank, little or no gain in profits expected this year, and Compaq and soon IBM breathing down its neck as a pack of clone makers nip at its heels, how will the company survive?

By fine-tuning a proven strategy, according to executives at the Irvine, California, supplier. "The process began three years ago," says marketing vice president Mike Morand. "We came out with a 486 machine priced the same as Compaq's 386. Then we introduced our notebook at half the price of a Compaq." AST will continue to drive down manufacturing costs and reorganize as needed, says Morand.

Since it moved from add-on boards to PCs in 1986, AST has garnered market share by offering new technology at better prices. Rather than charge a lot for hot products like the industry's first 25-MHz notebook, AST stuck with a moderate profit margin. "From a price and performance standpoint, as well as in serviceability, AST was the best pick," says Bart Everett, deputy systems editor at the *Los Angeles Times*, which plans to replace 1000 terminals with AST Premiums in the next five years.

With an unparalleled PC price war under way, the key to survival is reducing costs. Compared to Compaq, "AST has a much lower cost structure and has been playing this game for a long time," says Kimball Brown, director of PC hardware research at International Data Corporation in Mountain View, California. AST has remained consistently profitable, even with gross margins in the 30 percent range. And AST has created families of products tailored for various price points and distribution channels—which Compaq and IBM have yet to execute successfully.

Reaching Mass Markets

AST's year-old Advantage line is aimed at the small business/individual buyer who purchases through mass merchants such as Circuit City and superstores like Tandy's Computer City. AST intends to further segment the Advantage line with a $1000 to $1500 machine and a $1500 to $2000 model for the more sophisticated superstore buyer. The company aims to keep its low-end machines as fully featured as possible. "Giving less computer for a cheap price won't fly," says Dan Sheppard, AST director of product marketing. "Customers want it all."

AST is also completely upgrading its pricier models. The high-end Premium computers received a boost this spring with the Power Premium series, which offers upgradable processors, very fast graphics, and EISA slots. Additionally, AST sees great potential in its new Premium SE network servers. The Bravo line, designed for nonpower users, was redesigned in August with models that will let you upgrade your CPU via a daughtercard. And in late summer AST was expected to roll out a new line of slimline notebooks that have upgradable processors, memory, and screens.

Manufacturing Opportunity

AST's highly automated, low-cost manufacturing plants in Irvine, Taiwan, and Hong Kong let it turn out state-of-the-art products at aggressive prices—no small point. Direct marketers who farm out manufacturing must pay a middleman, which creates a 10 to 15 percent markup that may sink them in the current battle.

Customer service may be just as crucial. AST was among the first PC vendors selling through dealers to offer direct support as well. The company has built a reseller and customer service center that handles up to 2000 calls a day. AST offers a toll-free hotline, a bulletin board, faxed-back technical documents, and ExeCare for mobile users who need an overnight repair or replacement.

Financially, AST is in good shape with $150 million in cash and only $4 million in debt. It recently negotiated a $100 million line of credit—a war chest for what company executives privately call "this hostile environment."

—*Kathleen K. Wiegner*

AST's Blueprint to Survive and Thrive

How AST differentiates itself

- Early concentration on "value marketing" for price-motivated buyers
- Technology leadership (for example, first 33-MHz 486 desktop and 25-MHz notebook)
- Early entry into multibrand product lines and alternate distribution channels
- Emphasis on controlling costs, including ownership of manufacturing facilities in U.S. and Asia
- Willingness to place high-risk/high-payoff bets (like entry into Japanese market and adaption of non-Intel processor)

Now approaching a billion dollars in annual sales, AST Research has steadily taken steps that distinguish it from rival PC suppliers.

AST Sales Soar, but Profits Don't

Financial results for first quarter 1992

	AST	Compaq	Dell*
Sales (in millions of dollars)	241.6	783	366.1
Percentage sales growth from previous year	34	-19	109
Net income as percentage of sales	4	5.8	5.4
Percentage income growth from previous year	0	-60	96
R&D as percentage of sales	3.3	5.7	2.8

*Quarter ended May 3.

Wall Street likes AST's sales growth but won't let the stock rise until the company demonstrates solid earnings growth.

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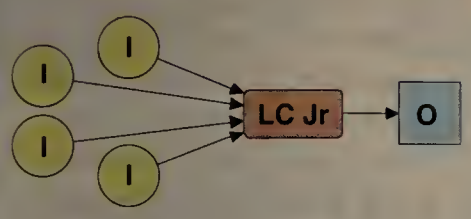
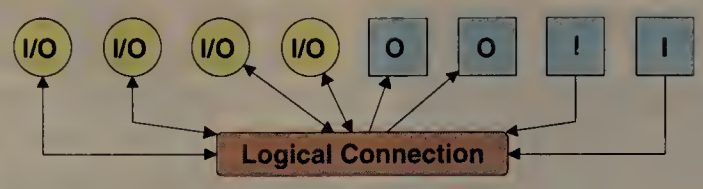
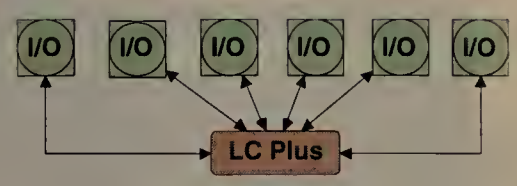
= PARALLEL DEVICE = SERIAL DEVICE = PARALLEL OR SERIAL DEVICE I = INPUT FROM PC O = OUTPUT TO PERIPHERAL

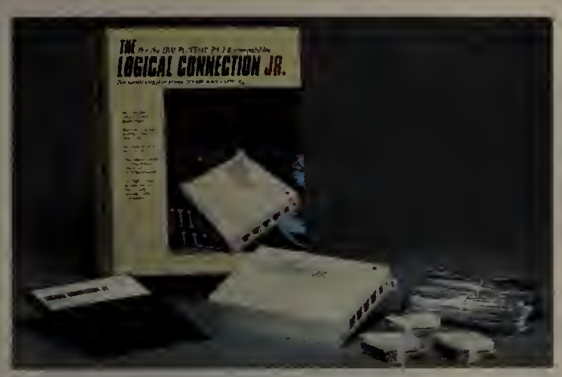






LC Jr.-256Kb $239

Serially connect up to four PCs to the **Logical Connection Jr.** at speeds up to 115,200 bps. It will automatically convert the data for easy sharing of one parallel printer.



LC-512Kb $495

The **Logical Connection** has eight ports: four bi-directional serial ports which can be set as input or output, two parallel inputs and two parallel outputs.

LC Plus-512Kb $695

All six ports of the **Logical Connection Plus** are automatically configured as parallel or serial, and input or output. Versatility and high speed are key features.

- **UL Listed Power Supplies**
- **FCC Class B Certification (LCJr. - A)**
- **Fast Data Input and Throughput**
- **Socketed DRAM Upgrades to 1Mb**
- **Largest Selling PSDs in the USA**

Logical Connections allow several users to easily share expensive printers and other resources. Choose the peripheral that you need with a pop-up menu or ASCII string.

Multiple users can send data simultaneously since Logical Connections with memory will buffer and queue jobs on a first-in-first-out basis. A 256Kb buffer will hold up to 100 pages of text or about 5 - 10 pages of graphics data.

If your company has a LAN, use Logical Connections for local printer sharing in smaller workgroups, rather than printing centrally through the LAN. Local printing is more convenient and more secure!

LC -41PAS $100

Smart switch to automatically connect up to 4 parallel inputs to 1 parallel output.

SPPS $60

Serial/Parallel or Parallel/Serial converter, no power supply required.

Logical Connection, Inc.
4660 Portland Road NE #108, Salem, OR 97305
FAX: (503) 390-9372
Tech. Support: (503) 390-9375

LOGICAL CONNECTION 800-238-9415 US & Can.

Laptop Memory

Macintosh Powerbook 100 (Dealer must install)

Memory Module	EPB-2000	2 Mb	call
Memory Module	EPB-4000	4 Mb	

Macintosh Powerbook 140/170 (Dealer must install)

Memory Module	EPC-4000	4 Mb	call
Memory Module	EPC-6000	6 Mb	

Toshiba Laptop Models: (User may install)

1000SE/XE/LE, 2000, 2000SX
2000SXE, 2200SX (exclude 1Mb)

Memory Card	RCT-1000	1 Mb	call
Memory Card	RCT-2000	2 Mb	
Memory Card	RCT-4000	4 Mb	
Memory Card	RCT-8000	8 Mb	

PC-MCIA 2.0 / JEIDA SRAM (User may install)

For Laptops conforming to this new universal spec.

Memory Card	RJB-0512	512 Kb	call
Memory Card	RJB-1000	1 Mb	
Memory Card	RJB-2000	2 Mb	

Circle 126 on reader service card

Customers Embrace Windows 3.1

Network Use, Stability, Configuration Hassles Remain Problems

Windows 3.1 Meets the Real World

Users Applaud . . .	. . . and Complain
Fewer crashes	Still crashes
Improved speed	Still too slow
Smoother graphical interface	Poor network management tools
Better File Manager	No file viewer
Scalable TrueType fonts	No deinstall program for applications
Opens more applications at once	No preemptive multitasking
Better integration of applications	Too big
Support for sound	Need for updated drivers

Users find plenty to laud and gripe about with Windows 3.1.

Surprise! Users report their satisfaction with *Windows* at an all-time high, but they still find plenty to complain about. They confirm that *Windows 3.1* actually is faster, manages multiple applications better, crashes less often, and offers big perks such as scalable fonts. Those who struggled with *3.0* are downright relieved that the new version finally fulfills the promise of a multitasking graphical environment.

But as with any love affair, flaws that were easy to ignore at first still haven't gone away. "Microsoft has fixed a lot of the problems with *3.0*, but *3.1* isn't as reliable or as robust as it might be," notes Rikki Kirzner, senior industry analyst at Dataquest.

And plenty of holdouts remain—particularly among companies with large inventories of older PCs, who don't take the plunge if existing software solutions seem to work. "In some cases, the devil you know is better than the devil you don't," says Bill Cornfield, president of the Windows Support Group in New York.

Nonetheless, Microsoft has done more than enough crowd pleasing to hold off IBM's OS/2. More than 3.5 million copies of *Windows* have rolled out the door, compared to 700,000 copies of OS/2.

A Stable Relationship

What's really selling *Windows* to new users is its newfound stability. Dave Miller, LAN manager for Northern Life Insurance in Seattle, installed 60 *Windows 3.1* workstations for agents who work with *WordPerfect* and need access to mainframe data. "*Windows 3.1* is the first version we felt was viable," he says.

Users enjoy touches like built-in scalable TrueType fonts. Brian Moura, assistant city manager for San Carlos, California, says his employees appreciate not worrying about font cartridges, printer memory, or additional font software. "Their perception was that fonts were confusing and a hassle," Moura says. "With *3.1*, the whole issue was dealt with overnight."

Corporate users who develop *Windows* apps praise *3.1* as a development environment. "The tools are more mature, more reliable, and perform better," says Bob Fulton, vice president of PHH Technology Services in Overland Park, Kansas, which develops in-house *Windows* applications. Fulton says that converting *3.0* applications to *3.1* required little work.

Rumbles in Paradise

Still, check any *Windows* forum and you'll find plenty of gripes. "Performance-wise, everyone is elated, but many experienced *Windows* users' expectations aren't being met," says Joel Diamond, technical director of the Windows User Group Network, which runs a CompuServe forum in Philadelphia. For example, says Diamond, "printing a TrueType document to a PostScript output device is like spending a day at an Atlantic City slot machine."

Users have also reported mysterious hardware memory problems, detected by a *3.1* module that catches hardware errors *3.0* missed, that prevent *Windows* from working. The solution? Check on memory-resident packages, and swap out any bad memory modules.

Another common complaint is that some old *Windows* applications and utilities need to be updated so they don't crash under *3.1;* others work with *3.1* but can't exploit its new features. Numerous video cards and printers require updated drivers, and you still often end up fiddling with configuration and system files.

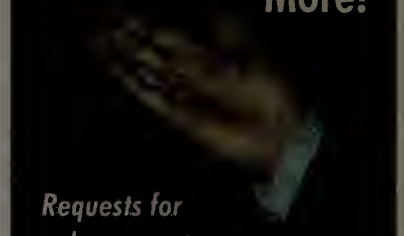
Customers also bemoan *Windows'* lack of network management tools. "*Windows* has a wonderful user interface, but managing it on a network is ugly," says Northern Life Insurance Corporation's Miller.

Finally, *3.1*'s network operations could be more robust. "If you lose a connection to the network, *Windows* doesn't know about it and there's no way, short of rebooting your system, to regain that connection," says Greg Boettcher, LAN administrator for Canada's Department of Industry, Trade, and Tourism in Winnipeg, Manitoba.

—Anita Amirrezvani

Anita Amirrezvani is a contributing editor for PC World, *and Kathleen K. Wiegner is a freelance author in Jemez Springs, New Mexico.*

What Do Users Want? More!



Requests for enhancements

"The GUI environment is intuitive for people familiar with computer systems, but it's still not enough like using a toaster."

—Greg Boettcher LAN administrator, Dept. of Industry Trade and Tourism Winnipeg

"We'd like *Windows* to have preemptive multitasking. Our 3270 emulation gets hung in the middle, and that's going to be a problem until *Windows* provides more robust memory management and control."

—Larry Shaw PC coordinator Nordstrom

"There needs to be a standardized way to remove applications under *Windows*. These applications put DLLs, subdirectories, and other files all over the hard disk, and there's no way for the average user to know what belongs to what program."

—Brian Moura City of San Carlos, California

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IMPACT

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Software for Microsoft Windows

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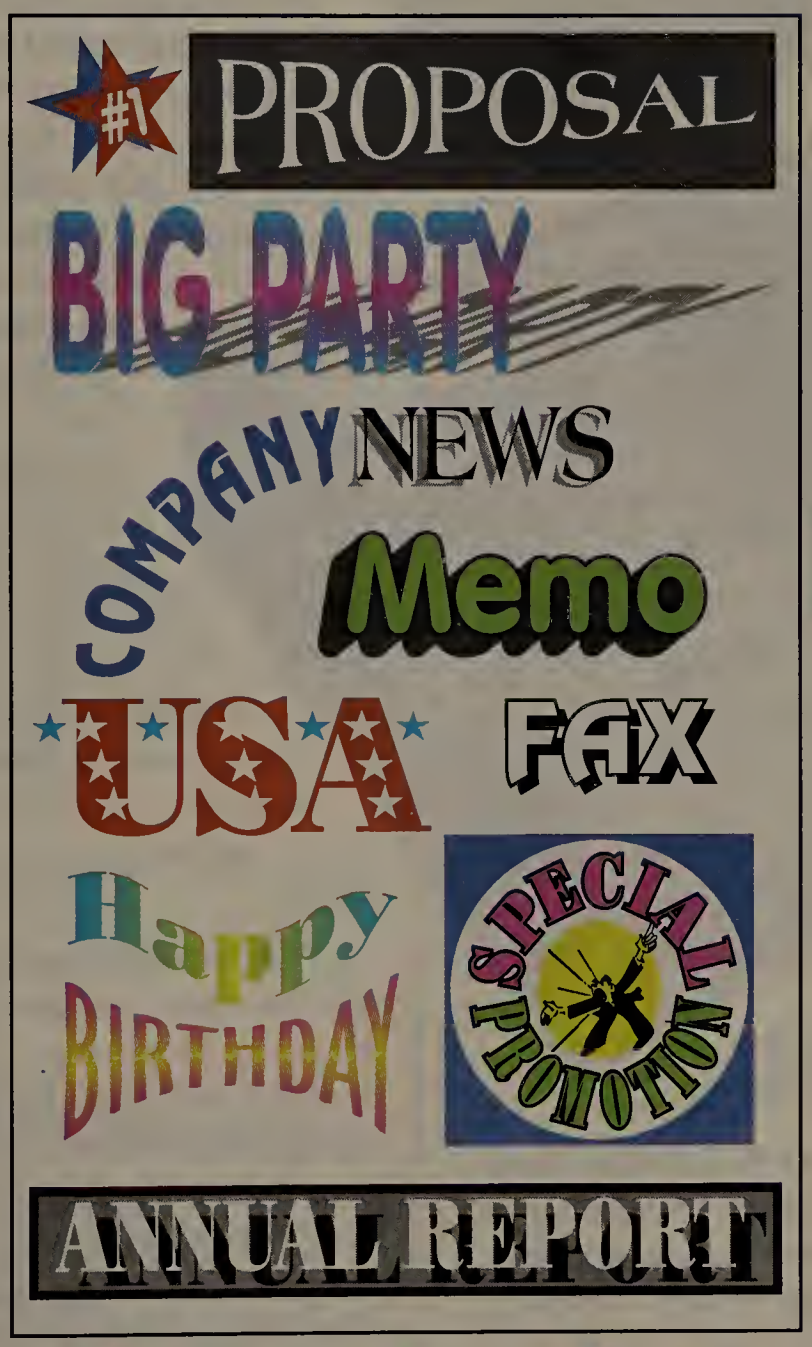

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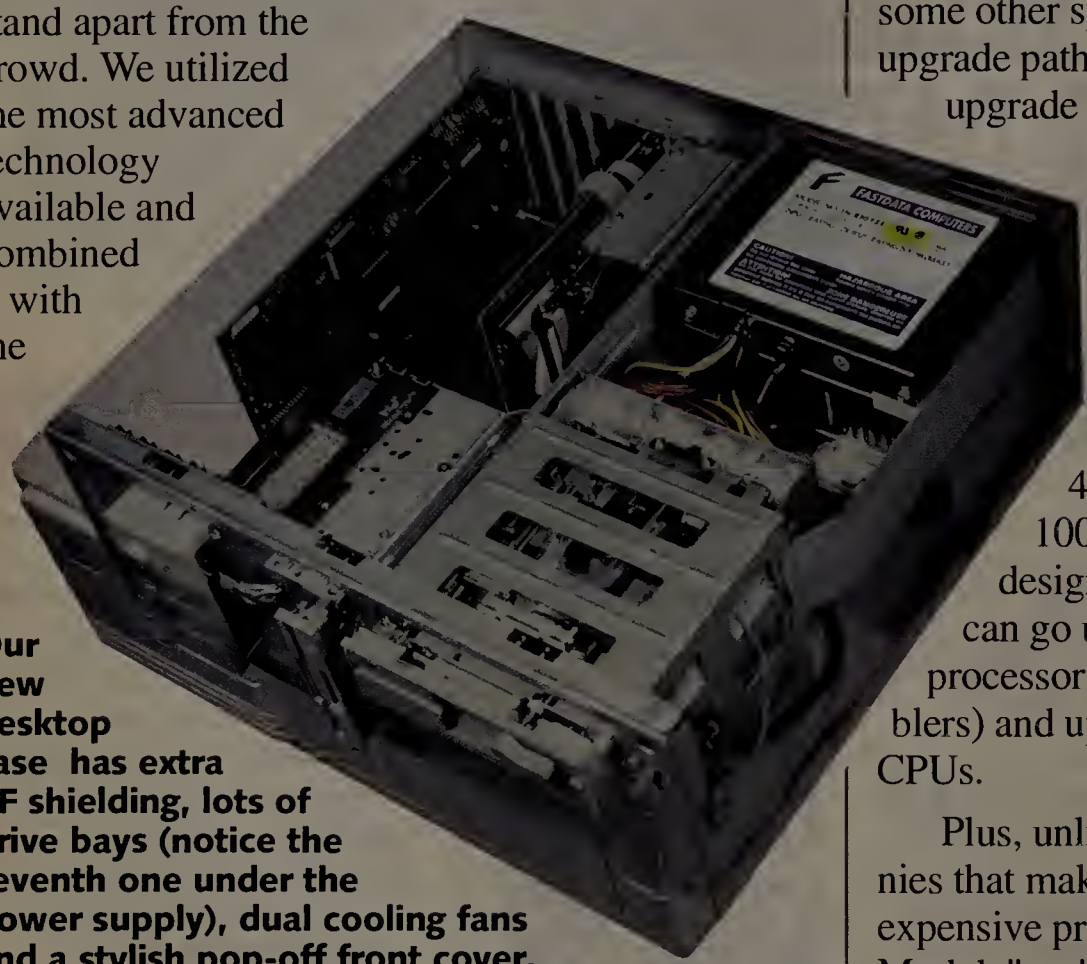
Offer ends 10/31/92

FASTMICRO RAISES THE 486 STANDARD

Our Next Generation of 486 PCs

At FastMicro, we've been building PCs for over six years, in fact, we've been doing it since the day we went into business. So when we sat down to design our most powerful FastData PCs ever, we wanted them to stand apart from the crowd. We utilized the most advanced technology available and combined it with the features our customers asked for most and came out with a whole new line of 486 PCs that are as different from our previous products almost as much as they are from our competitors' boxes.



Our new desktop case has extra RF shielding, lots of drive bays (notice the seventh one under the power supply), dual cooling fans and a stylish pop-off front cover.

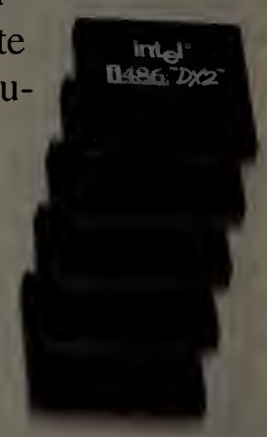
Advanced Case Design

Our new desktop case is uniquely engineered to provide the highest quality and maximum expandability in a space saving design. It has a total of seven drive bays to accommodate all of the storage options our customers tell us they want to be able to add in the future. It also has extra protection against electrical interference, unlike the weaker systems others sell.

The Most Processor Upgradability - All the Way to 100mhz!

We've designed our new systems to expand upon Intel's ambitious upgrade strategy. While some other systems have no upgrade path and others only let you upgrade from i486SX to i486SX or i486DX to i486DX (or DX/2), FastMicro's new systems can be upgraded to any 486 processor - 486SX or 486DX. So the 486SX you get today can be upgraded to a 486DX or DX/2 tomorrow. Imagine buying a FastData 486DX/33 now and upgrading it to a 100mhz DX/2 later - our systems are designed to do just that. You can go up to a 50mhz clock rate processor (100 mhz for clock doublers) and up to future upgrade CPUs.

Plus, unlike some other companies that make you purchase an expensive proprietary "CPU Module" or "Upgrade Card" not available anywhere else, all you have to do to upgrade your FastData 486 is to install a new processor, replace the clock crystal and change some system settings. That's it - no catches.

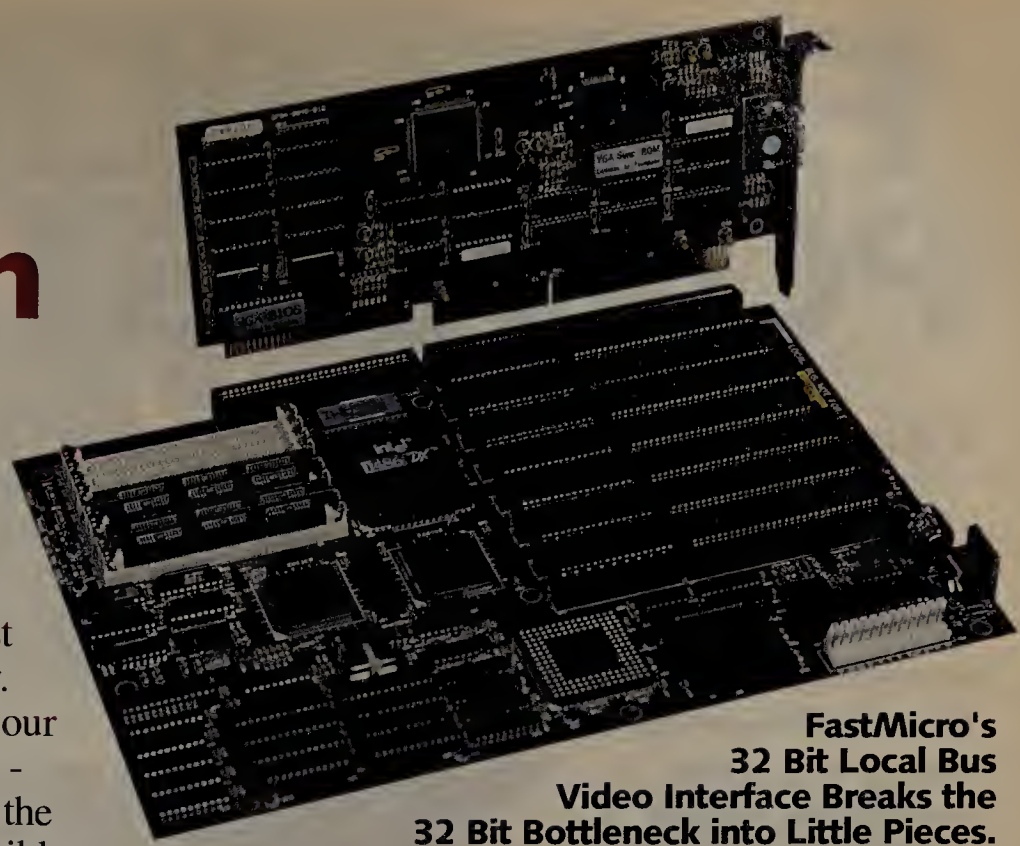


FastMicro protects your 486 investment.

Extra Cooling Power

Intel's new clock doubler chips put out much more heat than its predecessors. The i486DX/2 66mhz even requires a heat sink. FastMicro's new desktop PCs come with a second temperature-activated fan to dissipate system damaging heat. Not all systems are alike - FastMicro's last longer!

Turbocharge Windows with Local Bus Video Power



FastMicro's 32 Bit Local Bus Video Interface Breaks the 32 Bit Bottleneck into Little Pieces.

FastMicro's new systems feature the highest performance video options on the market today. From our standard 1mb Super VGA adapter to our highest performance Windows accelerator card - every video option we offer consistently yields the highest possible performance at the lowest possible cost.

Today's Windows environment is very dependent on video speed for overall system performance. The i486 is a high speed 32 bit processor, it handles data in and out in 32 bit chunks at external processor speed (such as 33mhz). The problem is that the ISA bus found in normal systems is 16 bit and only runs at 8 mhz, thus video performance is severely crippled!

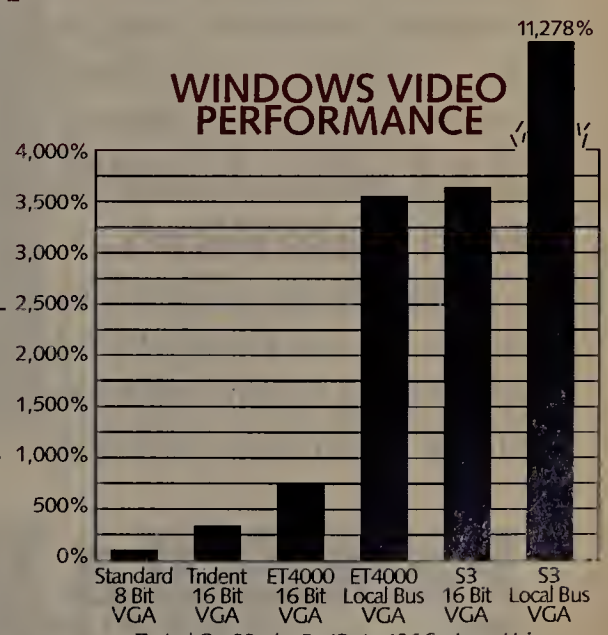
FastMicro removes the performance limit with its 32 bit high speed local bus. Plug the Local Bus Video Card into the special 32 Bit Slot and Windows flies!

BUYER'S CHECKLIST

	FastData 486's	Other 486SX's	Other 486DX's
486SX Overdrive Ugr.	X	X	
486DX Upgradable	X		?
486DX2 Upgradable	X		X
50/100mhz Upgradable	X		?
High Speed Video	X	?	?
7 Drive Bays	X		
Dual Cooling Fans	X		
GE On-Site Service	X		
Money Back Guarantee	X	X	X
7th Year in Business	X	?	?

The Highest Performance Video Options

FastMicro lets you choose from several different video cards and monitors to suit your individual application.



Tested On 33mhz FastData 486 Systems Using PC Magazine Windows Benchmark Tests

Some systems come standard with our Trident 1mb VGA card: it's 16 bit, runs Windows 3 times faster than standard 8 bit video cards and does up to 1024 x 768 at 256 colors . Other systems come standard with our PowerWin™ Hi-Color ISA card. It uses a Tseng Labs ET4000 Windows Accelerator Chip, it's more than twice as fast as the Trident card and it does a maximum of 32,768 colors. Our S3 NuclearWin™ Coprocessor ISA Video Card offloads the video processing from the CPU and, in turn, significantly multiplies performance. It's like having a second computer in your computer!

Choose one of our Local Bus 486 PCs and we'll include the Local Bus Version of our PowerWin Accelerator - it screams through Windows graphics. You can also upgrade to the Local Bus Version of the NuclearWin Card - it will run Windows up to 100 times faster than standard VGA Cards. Fasten your seat belts!

Circle 100 on reader service card

FASTMICRO 486 POWERSTATIONS

Powerful 170 Mb IDE Drive.

FastMicro includes Conner's CP-30174 170mb IDE hard drive standard in select FastMicro 486 PCs.

CONNER

Conner has a reputation for building the most reliable drives on the market, in fact, the CP-30174 has a MTBF (mean time between failures) rating of more than 150,000 operating hours. If you ran your FastData system 24 hours a day - that's more than *17 years*! Couple this with a <17 millisecond access time and 32K built-in cache and you won't want to gamble on a less reputable drive.

Start with FastMicro - Stay with FastMicro.

Why call one company to order your PC and another for everything else? FastMicro is the only leading system vendor that also advertises a full line of software, peripherals and more to complete your system and keep you abreast of all the latest technology products to maximize your computing productivity. Four times a year, we'll send you our informative catalog featuring over four hundred PC products at low FastMicro prices. It features everything from Windows software to books, accessories to networking, and printers to games.

With award winning systems and a full selection of hardware and software, FastMicro is truly your one-stop shop!

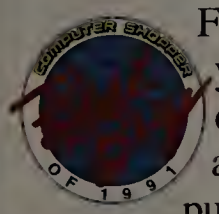
FastData Local Bus 486DX/33 $1799

- i486DX™ 33mhz Processor with 8K Internal Cache and 128K Memory Cache.
- 486DX and 486DX/2 Processor Upgradable
- 4 megabytes of high speed RAM.
- **170 mb 17ms IDE hard disk with 32K Cache.**
- 32 Bit Local Bus Video Slot.
- **32 Bit Local Bus Windows Accelerator Card.**
- 1.2mb 5.25" & 1.44mb 3.5" drives.
- Next Generation Desktop Case with 7 Drive Bays and Dual Cooling Fans.
- 72hz Non-Interlaced 14" Super VGA monitor, 1024x768 resolution.
- Parallel port, game port and two serial ports.
- MS-DOS 5.0, Microsoft Windows 3.1 & Serial Mouse.

Legendary FastMicro Service

FastMicro backs up all FastData PCs with the most comprehensive service in the business. Seven day a week toll-free technical support is included for as long as you own your FastData PC. In the unlikely event a part should fail during the one year warranty, we'll express ship you the replacement part. If we still can't resolve the problem, we'll send GE on-site or replace the system at no charge.

Don't buy your PC from one company and your software and peripherals from another.



FastMicro supports you better with our complete inventory of all the leading computer products at low FastMicro prices.

Satisfaction Guaranteed

We'd love to add you to the FastMicro family of satisfied customers. Every FastData 486 PC comes with our 30 day money back satisfaction guarantee.

But if you're like the majority of our customers, you'll be very satisfied. After all, at FastMicro, we want you as a customer for life - not just today.

When in Phoenix, come see us at our 107,000 square foot facility. For now, a call will do.

FastData 486SX/25 $1399

INCLUDES

- i486SX™ 25mhz Processor with 8K Internal Cache & 64K Static Ram Cache.
- 486 Processor Upgradable.
- 4 megabytes of high speed RAM.
- 120 mb 17ms IDE hard disk,.
- 1.2mb 5.25" & 1.44mb 3.5" drives.
- Mini-Tower Chassis.
- 72hz Non-Interlaced 14" Super VGA monitor, 1024x768 resolution.
- PowerWin Hi-Color Windows Accelerator.
- Clock calendar, parallel port, game port and two serial ports.
- 8 expansion slots, 2 occupied.
- MS-DOS 5.0.
- Microsoft Windows 3.1 & Serial Mouse.

FastData 486DX/33 $1699

- i486DX™ 33mhz Processor with 8K Internal Cache & 128K Static Ram Cache.
- Built-in Math Coprocessor.
- 486 Processor Upgradable.
- 4 megabytes of high speed RAM.
- 170 mb 17ms IDE hard disk,.
- 1.2mb 5.25" & 1.44mb 3.5" drives.
- New Generation Desktop Case.
- 72hz Non-Interlaced 14" Super VGA monitor, 1024x768 resolution.
- PowerWin Hi-Color Windows Accelerator.
- Clock calendar, parallel port, game port and two serial ports.
- MS-DOS 5.0.
- Microsoft Windows 3.1 & Serial Mouse.
- Add $400 for EISA (Business. Use Only).

FastData 486DX/50 $1999

- i486DX™ 50mhz Processor with 8K Internal Cache & 128K Static Ram Cache.
- Built-in Math Coprocessor.
- 486 Processor Upgradable.
- 4 megabytes of high speed RAM.
- 170 mb 17ms IDE hard disk,.
- 1.2mb 5.25" & 1.44mb 3.5" drives.
- New Generation Desktop Case.
- 72hz Non-Interlaced 14" Super VGA monitor, 1024x768 resolution.
- PowerWin Hi-Color Windows Accelerator.
- Clock calendar, parallel port, game port and two serial ports.
- MS-DOS 5.0.
- Microsoft Windows 3.1 & Serial Mouse.
- Add $400 for EISA (Business. Use Only).

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Circle 100 on reader service card

Bargains of the Month

Dell's System 325 SX and Dimension NL25 were the most aggressively priced desktop and portable PCs in the June survey by International Data Corporation.

Best-Sellers

Leading PCs sold through computer stores and traditional dealer channels

1. *IBM PS/2 Model 70/20*
2. *IBM PS/2 Model 55 SX*
3. *Compaq Deskpro 386/25M*
4. *Compaq LTE Lite/25*
5. *IBM PS/2 Model 35 SX*
6. *Compaq LTE Lite/20*
7. *Compaq Deskpro 386s/20*
8. *IBM PS/2 Model 56 SX*
9. *IBM PS/2 Model 56 SLC*
10. *IBM PS/2 Model 40 SX*

IBM's PS/2 Model 55 SX, which is being taken off the market, has finally given up its lead in dealer sales, according to Storeboard Channel Tracking's May survey.

Over the Counter

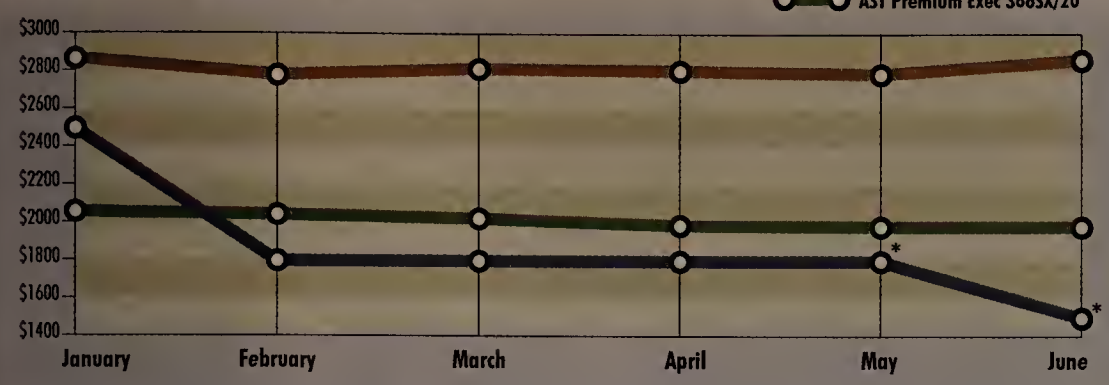
What you pay at retail stores for popular PCs

	Configuration				National				
	Speed (MHz)	RAM (MB)	Hard disk (MB)	Video adapter	List	Average	Boston	Chicago	Dallas/Ft. Worth
80386SX/SLC-based desktop PCs									
Compaq Deskpro 386s/20	20	2	60	VGA	$1899	$1611	$1609	$1584	$1696
Dell System 325 SX	25	2	52	VGA	$820	$820	$820	$820	$820
IBM PS/2 Model 35 SX-043	20	2	40	VGA	$1520	$1330	$1375	$1255	$1356
IBM PS/2 Model 56	20	4	80	VGA	$3030	$2413	$2412	$2459	$2437
IBM PS/2 Model 56 SLC	20	4	80	VGA	$3560	$2855	$2895	$2777	$2988
NEC PowerMate SX/20i	20	2	60	VGA	$1599	$1339	$1351	$1250	$1396
80386DX-based desktop PCs									
AST Power Premium	33	4	210	VGA	$3395	$2784	$2751	$2943	$2433
Compaq Deskpro 386/25M	25	4	120	VGA	$3199	$2760	$2754	$2948	$2933
Dell System 333P	33	4	230	VGA	$1600	$1600	$1600	$1600	$1600
Gateway 2000 33-MHZ 386VGA	33	4	200	VGA	$1345	$1345	$1345	$1345	$1345
IBM PS/2 Model 70-A16	25	4	160	VGA	$5475	$4054	$4208	$3824	$4224
80486SX-based desktop PCs									
ALR BusinessVEISA	20	5	120	n/a	$3495	$2912	$2915	$3123	$3022
AST Premium II 486SX/20	20	4	80	VGA	$3495	$2978	$3012	$2990	$2971
Compaq Deskpro 486s/25M	25	4	120	VGA	$3699	$3102	$3154	$3118	$3213
IBM PS/2 Model 90XP-OH9	25	4	160	VGA	$6545	$5016	$5171	$5258	$5137
80486DX-based desktop PCs									
AST Power Premium 486/33	33	4	210	VGA	$3795	$3129	$3082	$3036	$3036
Compaq Deskpro 486/33M	33	4	340	VGA	$5499	$4635	$4624	$4520	$4637
Compaq Deskpro 486/50L	50	8	340	VGA	$12,999	$11,033	$11,214	$10,840	$11,590
IBM PS/2 Model 90 XP-OKF	33	8	400	XGA	$9295	$7332	$7412	$7722	$7460
NEC PowerMate 486/33e	33	4	300	none	$5299	$4430	$4366	$4285	$4575
Portables									
AST Premium Exec 386SX/20	20 (SX)	2	40	VGA-LCD	$2395	$1981	$1945	$2034	$2225
AST Premium Exec 386SX/25	25 (SXL)	4	80	VGA-LCD	$3295	$2862	$2784	$2735	$3081
Compaq LTE 386s/20	20 (SX)	2	30	VGA-LCD	$3599	$3010	$3285	$2986	$3170
Compaq LTE Lite/20	20 (SL)	2	60	VGA-LCD	$3199	$2805	$3124	$2799	$2762
Dell System NL25	25 (SL)	2	80	VGA-LCD	$1849	$1849	$1849	$1849	$1849
IBM PS/2 Model L40 SX	20 (SX)	2	60	VGA-LCD	$1965	$1725	$1845	$1609	$1757
NEC UltraLite SL/20	20 (SL)	2	80	VGA-LCD	$2999	$2637	$2451	$2549	$2602
Toshiba T3300SL	25 (SL)	2	80	VGA-LCD	$3599	$3152	$3214	$3192	$3199
Toshiba T4400SX	25 (486SX)	2	80	VGA-LCD	$4349	$3764	$3841	$3873	$3825
ZDS MastersPort 386SLe	25 (SL)	2	60	VGA-LCD	$3799	$3070	$3102	$2951	$3419

From an IDC survey of more than 180 computer dealers in eight metropolitan areas. Figures based on at least four price quotes for each machine. Prices are based on manufacturer's standard configuration without monitor.

Trend Line: Notebooks Start to Trim Down

Average national street prices on selected notebook PCs



*Dell System NL20 with SL processor

Dell has been carving away at its notebook prices, but AST managed to maintain pricing until June. Late that month (after this survey was completed) notebook costs took a substantial hit, producing new low-end price points. Among SL-based offerings, for instance, Dell now offers its NL20 with 60MB drive for $1499, while a similar Compaq Contura model that lists for $1699 will sell on the street for only slightly more than Dell's NL20.

Metropolitan

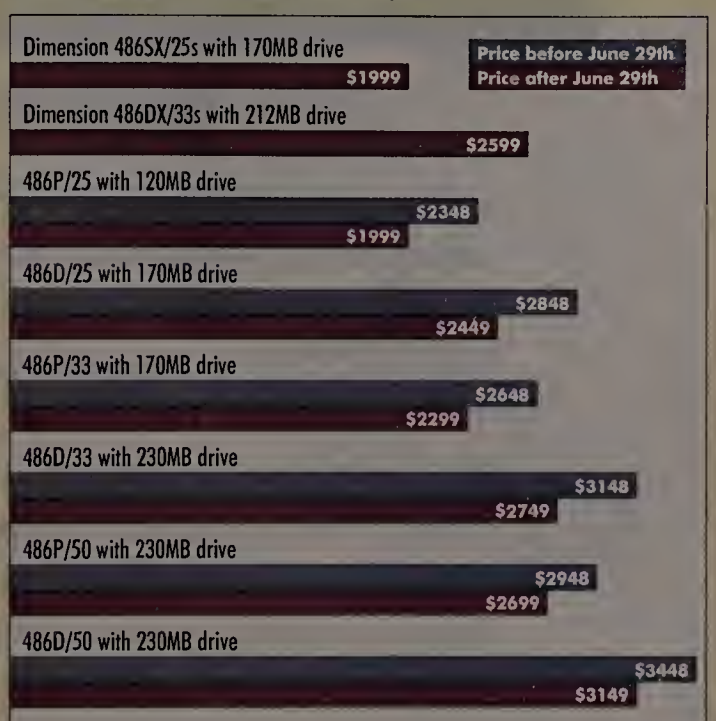
Los Angeles	Miami/ Ft. Lauderdale	New York	San Francisco Bay Area	Washington, D.C.
$1604	$1587	$1573	$1625	$1547
$820	$820	$820	$820	$820
$1379	$1317	$1349	$1345	$1354
$2368	$2355	$2446	$2425	$2426
$2848	$2770	$2866	$2832	$2845
$1319	$1320	$1363	$1323	$1302
$2770	$2949	$2737	$2754	$2715
$2669	$2667	$2726	$2621	$2587
$1600	$1600	$1600	$1600	$1600
$1345	$1345	$1345	$1345	$1345
$4062	$3919	$4201	$4023	$4151
$2875	$2857	$2853	$2891	$2845
$2950	$3031	$2946	$3021	$2987
$3168	$3007	$2992	$3241	$3178
$5236	$4675	$5002	$5215	$5136
$3005	$3345	$3041	$3210	$3145
$4709	$4708	$4520	$4789	$4761
$10,683	$10,876	$11,009	$10,951	$10,904
$7436	$6915	$7372	$7456	$7481
$4353	$4462	$4332	$4395	$4354
$1994	$2188	$1864	$2021	$2054
$2996	$2923	$2722	$3021	$3054
$2814	$3024	$3209	$2874	$2861
$2789	$2907	$3092	$2791	$2781
$1849	$1849	$1849	$1849	$1849
$1962	$1670	$1740	$1984	$1989
$2943	$2215	$2414	$2841	$2798
$3070	$3267	$3114	$3021	$3015
$3749	$3892	$3786	$3784	$3781
$3039	$3134	$3049	$3081	$3154

PC Futures: Falling, Falling for You

In early summer another dam burst on PC pricing as Compaq launched a revamped line at very aggressive prices. International Data Corporation's monthly survey data, gathered just before Compaq's move, doesn't reflect the significant cuts that then swept across the market. Dell Computer, for example, slashed prices on its product line up to 20 percent on June 29. Other major vendors dropped their pricing as well, and many PC manufacturers expect tremendous pressure on profits this year. "It's a wonder to us why Compaq would cut so low and how Compaq's making money," frets one executive. A shakeout has begun among PC suppliers, with a few smaller firms closing their doors. Analysts say that some significant players such as Zeos Int'l, which was running at a loss even before the wave of price cuts, are imperiled.

A Dell of a New Price

*Costs of selected Dell Computer 486SX/DX systems**



* With DOS, Windows, monitor, ond mouse.

Dell, which sells direct to customers, shows the ballpark where PC vendors now must play for low-to-midrange 486SX/486DX systems.

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document #1521 for FG family brochure, #23766 for CDR-74/84 and 37, #632672 for Multimedia Upgrade Kit.

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New 386 Notebooks

THE SHAPE OF PCs TO COME

With 25-MHz power, 80MB to 130MB hard disks, and greater expandability, the best new 386 notebooks make capable desktops too. Don't believe it? Check out 21 of the latest 386SLs and 386SXLs.

Notebook computers have long been thought of as second machines—nice for the road, maybe, but no threat to a desktop system. But today's portables have developed to the point where they can easily pull double duty, serving you just as well on the desktop as on the airline tray table.

Don't believe it? Take a look at the new batch of 25-MHz notebooks. Based on Intel's 386SL and AMD's 386SXL chips, they're being marketed on the basis of their power management skills. But efficient power use doesn't mean less processing punch. In fact, given the ease with which a memory cache can be added to SL-based systems (thanks to the chip's built-in controller), many of these notebooks will be faster than the average 25-MHz desktop.

But what about storage, displays, and expandability, you say? No problem. You can outfit one of these notebooks with a 130MB hard drive and up to 20MB of RAM. Most can be hooked up to super-VGA monitors and full-size keyboards. Some can be plugged into an optional expansion chassis, which can be permanently outfitted with monitor and keyboard and which also gives you a couple of ISA expansion slots. Others can be expanded using one of the new PCMCIA slots (see "PCMCIA: The Notebook Expansion Slot").

Of course, you'll have to make a few sacrifices to use a notebook as your everyday system. Keyboards are small and often poorly laid out. Users who need more than 130MB of storage will be out of luck. Color and expansion are expensive. For that matter, at a time when fully equipped desktop 386SXs can be had for under $1500, these notebooks can easily run twice that. (Of course, Compaq's dramatic price reductions—announced just as this issue went to press—will probably have a salutary effect on prices industrywide.)

BY MICHAEL GOODWIN AND DAN MILLER

ILLUSTRATION BY TOMEK OLBIŃSKI, PHOTOS BY ROBERT CARDIN

ZENITH DATA SYSTEMS
Z-NOTE

So the notebook-as-desktop scheme won't work for everybody. But for many users, a 25-MHz notebook on the desktop makes a lot of sense. Busy executives who need their data outside the office as much as in, and who don't really need the fastest available computers, are particularly good candidates. Thanks to new pointing devices, improved screens, and, of course, fast processors, these machines make pretty decent *Windows* workstations too.

They Keep Going and Going and Going...
For this review, we chose to focus on 21 of the newest 25-MHz notes: those built around Intel 386SL and AMD 386SXL chips. Both are fully powered 386SXs that have been tweaked to reduce power consumption in portable computers.

First, the chips themselves use less power. According to Intel and AMD, at 25 MHz an SL uses about 6 percent less power than a regular 386SX, and an

Buying Smart: A Notebook Primer

Speed is always desirable—and it won't take more than a few business trips for you to agree that portability is even more important. But for a notebook to stand out from the crowd, it requires a felicitous combination of other features too, ranging from a familiar keyboard layout to a generous service contract.

PORTABILITY
Size is nearly as big a factor as weight in ease of transport. All these systems are small enough to fit in a briefcase, but if you plan to work on an airplane, look for a model with an inset cover hinge for easier tray-table operation. Even when we add a mouse to our "traveling weight" calculation (which then includes PC, battery, built-in floppy, mouse, AC charger, power cords, and modem), only one note is over 9 pounds—and 12 of them weigh 8 pounds or less. Gateway, Tandy, and USA Flex tie for the lightest: 7.5 pounds.

PERFORMANCE
Our tests show that the SL notebooks' memory cache gives them a clear performance advantage over the SXLs. In calculating the overall performance ratings, we weight the *1-2-3* test highest, but if you run a lot of disk-intensive applications, keep a close eye on the *dBASE* scores too. All performance tests were done with power-saving features turned off, so if you're planning on marathon sessions away from a power plug, expect slower performance. The two speed winners are color systems: NEC's UltraLite SL/25C and Dell's 325NC.

POWER MANAGEMENT
For people who merely shuttle their notebook between office and home, battery life is a nonissue. But the rest of us will appreciate the convenience of checking a spreadsheet in the middle of a meeting without plugging in, or pulling down E-mail via modem when the power plug and phone line are on opposite sides of the room.

The size and weight of the power cell, and the technology inside, all have a big effect on battery life. Nickel-hydride batteries have several advantages, including rapid recharge. Power-saving options can keep the computer running a lot longer. Timeouts for hard disk and backlighting are standard these days. In addition, all these notebooks let you reduce power consumption to near zero via a *suspend* or *sleep* mode that slows or stops the CPU. Awakening the notebook resumes operations from the exact point you left off. You can engage sleep mode either by pressing a special button (which is best and quickest) or via a preset timeout. Advanced Power Management (APM) will eventually offer the best (and least annoying) power-saving options (see "Smart Software Extends Battery Life"). Only four of the notebooks here support APM: BCC's Avanti 025, PC&C's Dynova Model SLic3000, Tandy's 3830 SL, and ZDS's Z-Note 325L Model 85.

Our battery tests are evolving as vendors improve power management techniques. The tests in this roundup (which differ from those used in previous notebook roundups) simulate an average work session. Power-saving features are enabled, and several periods of inactivity are included to let disk, screen, and CPU timeouts take effect. ZDS's Z-Note 325L Model 85 turned in the best power score: nearly 5 hours.

DISPLAY
Nowadays all notebooks have backlit or sidelit displays. Big screens are generally easier to read, but watch out for wide screens that distort graphics—and make sure the characters are sharp and crisp, with good contrast. Dell's Dimension NL25 boasts the biggest screen in the roundup: almost 46 square inches, or 9.7 inches diagonally. But when you factor in sharpness, color, and super-VGA output, NEC's UltraLite SL/25C and Tandy's 3830 SL take top screen honors.

EXPANDABILITY
Many applications (especially *Windows*) run faster when they can access lots of memory, so make sure you get at least 6MB. All these notebooks provide at least 60MB of storage, but *Windows* users should look

SXL uses 27 percent less.

Second, both chips can be slowed to almost 0 MHz without losing the contents of their registers (regular SXs can only go down to 2 MHz); that means virtually all power to these chips can be shut off whenever it isn't required. The SLs also have special registers and memory reserved just for processing power management instructions.

What does all this sophisticated power management get you? Right now, not much. In our battery life tests, the SLs averaged just over 3 hours, while the SXLs averaged just under—good times, but not amazing.

for a larger hard disk option. The new PCMCIA slot promises a host of new plug-and-play peripherals—at least when the cards are available. Only two of the systems here boast a PCMCIA slot: the NCR and the Toshiba. Alternatively, check to see if the notebook you're considering offers an optional expansion chassis or docking station—that will make desktop replacement a lot more practical. We consider an internal modem option a necessity. The Epson, the NCR, and the Toshiba tie for top expandability honors.

KEYBOARD

The closer your notebook keyboard comes to the standard 101-key model, the better. Emulated keys (which, for example, force you to hold down a special key to turn a cursor key into <Page Down>) slow typing and increase errors. Look for dedicated cursor keys in the familiar inverted T, and dedicated page and function keys. Standard layout for <Alt> and <Ctrl> makes life easier too. The Compudyne, Twinhead, and ZDS share the keyboard championship.

PRICE

On the whole, SXLs are cheaper than SLs because the SXL chip can simply be dropped into older SX motherboards. In any case, we base our cost comparisons on street price. For every machine (except those sold direct), our research staff calls PC dealers in major cities across the country and gets a quote in the standard *PC World* configuration: 4MB of RAM, 60MB to 80MB hard disk, 1.44MB internal floppy drive, 2400-bps internal modem, mouse or trackball, *Windows*, and DOS. Results are averaged. The low-ball boss is PC&C's Dynova Model SLic3000 at a cool $1937.

A precautionary note: As we went to press, Compaq had just announced a set of huge price cuts to its notebook line. This action is bound to have a domino effect on other vendors, which means that system prices, volatile at best, are about to become even more changeable. So be sure to check current pricing before you make a final buying decision.

SERVICE AND SUPPORT

The key service issue for notebooks is a quick turnaround on repairs, since there's little an on-site technician can do aside from recovering data. We evaluate support by calling each tech number three times and scoring responses for accuracy and promptness, with extra credit for long hours, fax lines, and BBS's. We rate dealer support by tallying the requirements vendors impose on dealers for training, inventory, and dedicated support staff; we give extra credit for vendors that operate their own stores. Best service and support: Dell and Twinhead.

Cream of the Notebook Crop

Still, these 21 notebooks turned out to be an especially nice bunch. The SLs, as a group, were faster and the SXLs cheaper. But when the last spreadsheet had been recalculated and the last battery run down, three systems emerged as Best Buys—Dell's Dimension NL25, Twinhead's Slimnote 386SXL/25, and Zenith Data Systems' Z-Note 325L Model 85.

The Dell and ZDS are both SL based, which explains their fast performance. The Twinhead's an SXL, which helps explain its low price. It's near the top of the generally slow SXL class on performance and scores high in portability and the quality of its display and keyboard. What sets the Dell apart from the rest is its big screen and small size, while the ZDS stands out for top-of-the-line battery life. Of the three Best Buys, the Twinhead costs the least, while the ZDS is fastest and thriftiest with the battery.

How would one of these three work as a desktop machine? If you spend more time in the office than on the road, the ZDS has enough power and expandability to make an excellent full-time system. If, on the other hand, you need a system that excels on the road and won't make you suffer in the office, you can't go wrong with the Twinhead.

Will the advent of faster, better notebooks spell the end of desktop computers? Probably not anytime soon. Still, as notebook capabilities increase and business users continue to look for ways to stretch their computer budgets, notebook computers could become as familiar a sight on desktops as on that famous airplane tray table.

Michael Goodwin is an associate editor, Dan Miller an assistant editor, and TJ Byers a contributing editor for PC World. *They can be reached on PC World Online (see page 8 for more information).*

For more information about all products in this article, circle reader service no. 904.

AST Premium Exec 386SX/25

★★½ **PROS:** Good service and support
CONS: Pricey, small screen, awkward design

AST's Premium Exec 386SX/25 is a perfectly usable notebook, but the minuses outweigh the pluses. Its $3480 price is on the high side, and since it lacks a cache, its performance is unexciting. Its 8.9-pound traveling weight is comparatively heavy, and the unit is fairly large. And while the 8.4-inch-diagonal paper-white display is crisp and sharp, it's still one of the smallest in the roundup. There are some ergonomic problems as well: The awkward front latch is hard to operate, as are the power switch and the brightness and contrast sliders located just below the screen.

So is there anything to like? Sure. You get a good 82-key keyboard with dedicated cursor and page keys, and an 80MB, 19ms Conner CP2084 hard drive. Two hours and 47 minutes of battery life isn't bad, and you can change the battery without powering down. And tech support works weekends. But adding it all up, it's clear this is not a compelling value.

AST's Premium Exec 386SX/25 gives you a fine keyboard, but the high price spoils the picture.

The BCC Avanti 025's unique design includes a pivoting screen and a slanted keyboard.

BCC Avanti 025

★★★½ **PROS:** Lightweight, pivoting screen, good battery life, APM
CONS: Nonstandard keyboard

The Avanti 025's black contoured case makes it look a bit like Darth Vader's battle notebook and makes it easy to hold. The sharp 9.4-inch screen is pivoted and slides forward for positioning on even the smallest tray table. Performance is what you'd expect in an SXL: on the slow side. But the 8-pound unit is relatively light, and power management is tops. The Avanti ran for well over 3 hours, and with APM-aware software installed, you can expect it to run even longer.

Unfortunately, the 80-key keyboard is bad news: The cursor keys are arrayed in the finger-frustrating recumbent L, the page keys are emulated, and the function keys are very small. Still, $2999 isn't a bad price considering that it includes a 9600-bps fax-modem and a software bundle that contains *WinFax*, *Terminal Plus*, and *Magic Cursor*. If you can handle the keyboard, this notebook is hard to resist.

Compaq LTE Lite/25

★★★½ **PROS:** Fast, good battery life, big screen, highly portable, fine keyboard
CONS: Pricey

Compaq's upgraded version of its LTE is a real winner. The Lite/25 weighs in at a featherweight 7.7 pounds (compared with the old 9.5) and boasts a fine 80-key keyboard with cursor keys in the standard inverted T. Who could ask for anything more? One of the biggest, sharpest, snappiest screens in the roundup? A nickel-hydride battery with 3 hours and 20 minutes of life? A pop-up battery gauge that checks operating conditions (like how bright the backlighting is) before it estimates battery life? No problem. Four-star performance is built-in too: this system takes fifth place overall, with a tie for first on the *WordPerfect* test.

Of course, a $4306 street price is not cheap. But just as we went to press, Compaq announced huge list price reductions that should lower this price significantly. If not for the price, this would be a Best Buy—and with the falling tariff, by the time you read this it may well be.

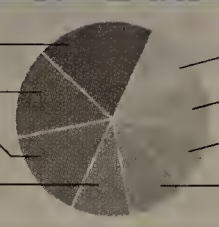
Compaq's LTE Lite/25 is lighter, smaller, faster, and much easier to use than the good old LTE.

Dell, Twinhead, and ZDS Take Top Notebook Honors

Whether portability or processing power is your highest priority, one of our Best Buys will provide it.

With our three 25-MHz SL/SXL Best Buy notebooks, you get power and portability: The **Twinhead Slimnote 386SXL/25** is the fastest SXL—and ties for the smallest size in the roundup. The **Dell Dimension NL25** delivers four-star performance and the biggest display, and it weighs only a hair over 8 pounds. **The ZDS Z-Note 325L Model 85** is the third-fastest system we tested, runs for almost 5 hours, and still weighs under 8.5 pounds.

Key Buying Issues: Percentage of Importance



Excellent ★★★★
Good ★★★
Fair ★★
Poor ★

	Reader service number	Portability	Performance	Power management	Display	Expandability	Keyboard	Price*	Service and support	Overall value
AST Premium Exec 386SX/25	680	☆☆½	☆☆½	☆☆☆½	☆☆	☆☆☆	☆☆☆	☆☆½	☆☆☆½	★★½
BCC Avanti 025	681	☆☆☆☆	☆☆☆	☆☆☆☆	☆☆☆	☆☆☆	☆☆	☆☆☆	☆☆☆	★★★½
Compaq LTE Lite/25	682	☆☆☆☆	☆☆☆☆	☆☆☆½	☆☆☆½	☆☆☆½	☆☆☆½	☆½	☆☆☆½	★★★½
Compudyne Slimline 386SXL/25	683	☆☆☆☆	☆☆☆	☆☆☆½	☆☆☆½	☆☆½	☆☆☆☆	☆☆☆☆	☆☆½	★★★½
Dell 325NC (color)	684	☆☆½	☆☆☆☆	☆☆☆☆	☆☆☆½	☆☆☆½	☆☆☆½	☆☆☆	☆☆☆☆	★★★½
Dell Dimension NL25	684	★★★★	★★★★	★★★★	★★★	★★½	★★★½	★★★	★★★½	★★★★
Epson NB-SL/25	685	☆☆	☆☆☆☆	☆☆☆½	☆☆½	☆☆☆☆	☆☆☆	☆☆	☆☆☆	★★★
Gateway 2000 Nomad 325SXL	687	☆☆☆☆	☆☆☆	☆☆☆½	☆☆☆½	☆☆½	☆☆☆	☆☆☆☆	☆☆☆	★★★½
Insight 386SXL-25	688	☆☆☆☆	☆☆☆	☆☆☆½	☆☆½	☆☆☆½	☆☆½	☆☆☆☆	☆☆☆½	★★★½
Mitac 3027F	691	☆☆☆	☆☆☆☆	☆☆☆½	☆☆	☆☆☆½	☆☆½	☆☆☆	☆☆½	★★★
NCR Safari 3170	692	☆☆☆½	☆☆☆☆	☆☆½	☆☆½	☆☆☆☆	☆☆½	☆	☆☆☆	★★★
NEC UltraLite SL/25C (color)	693	☆☆	☆☆☆☆	☆☆½	☆☆☆☆	☆☆☆½	☆☆½	☆☆☆	☆☆☆	★★★
PC&C Dynova Model SLic3000	694	☆☆½	☆☆☆☆	☆☆☆½	☆☆☆	☆☆☆	☆☆☆	☆☆☆☆	☆☆☆	★★★
Samsung NoteMaster 386S/25	695	☆☆☆☆	☆☆☆	☆☆☆	☆☆½	☆☆☆½	☆☆½	☆☆☆½	☆☆☆	★★★
SunRace HyperBook 2200SX/25	696	☆☆☆½	☆☆½	☆☆☆½	☆☆☆	☆☆☆	☆½	☆☆☆☆	☆☆☆	★★★
Swan 386SX/25	697	☆☆☆☆	☆☆☆	☆☆½	☆☆½	☆☆☆½	☆☆½	☆☆☆	☆☆☆	★★★
Tandy 3830 SL	698	☆☆☆☆	☆	☆☆☆½	☆☆☆☆	☆☆☆½	☆☆☆	☆☆☆	☆☆☆½	★★★
Toshiba T3300SL	699	☆☆☆☆	☆☆☆☆	☆☆☆½	☆☆☆	☆☆☆☆	☆☆☆½	☆	☆☆☆	★★★½
Twinhead Slimnote 386SXL/25	700	★★★★	★★★	★★★½	★★★½	★★★	★★★★	★★★½	★★★½	★★★★
USA Flex FlexNote 386SXL	701	☆☆☆☆	☆½	☆☆	☆☆	☆☆☆	☆☆☆	☆☆☆½	☆☆☆½	★★½
ZDS Z-Note 325L Model 85	702	★★★½	★★★★	★★★★	★★★½	★★★½	★★★★	★★	★★★½	★★★★

Overall value is produced by multiplying each category rating by its weight percentage, summing the results, and grading on a curve to the nearest half number.

*Price ratings are based on street prices. Before the ratings are calculated, however, the street prices are adjusted to allow for bundled software and hardware over and above our standard configuration. One-quarter of the list price of the software is deducted. If the system is sold via dealers, 70 percent of the list price of the extra hardware is deducted; if the system is sold direct, 100 percent of the list price of the extra hardware is deducted. Bundled software and extra hardware for each system are noted in the Features Evaluation.

Compudyne Slimline 386SXL/25

★★ ★½ **PROS:** Inexpensive, highly portable, good battery life, big screen, great keyboard with built-in trackball **CONS:** No display timeout, low RAM capacity

If price and portability are your highest priorities, take a look at Compudyne's Slimline 386SXL/25. This light-gray notebook ties for the smallest system here, and its 7.8-pound traveling weight is extremely light. Moreover, $1952 is one of the lowest prices in the roundup—and includes a copy of *PackRat*. This is an SXL, so performance isn't dazzling, but 3 hours, 33 minutes of battery life *is*—and you can swap batteries without turning off the power. Unfortunately, you can't set a timeout for the display.

The paper-white display is a nice big 9.4 inches across the diagonal, but adjusting the screen for dark black characters is hard. The 85-key keyboard is almost perfect: All the page, cursor, and control keys are right where your fingers expect them. There's even a built-in trackball, but it's placed far to the left, where it's awkward to use (except for lefties). Despite a low 6MB RAM capacity, this is an appealing notebook.

Compudyne's Slimline 386SXL/25 is one of the smallest and least expensive notebooks here.

Looking for a fast color notebook at a monochrome price? Check out Dell's hot 325NC.

Dell 325NC

★★ ★½ **PROS:** Color display, fast, excellent battery life
CONS: Heavy, bulky

Dell's color notebook is a remarkable value. While its passive-matrix screen isn't nearly as gorgeous as the NEC's active display, its price is astonishing. Sure, $4497 is high—but not for color. Dell's 325NC is actually $205 cheaper than NCR's monochrome system! On top of which, this SL notebook with a 64K cache is the second-fastest box we tested—and 3 hours and 40 minutes of battery life is close to the best in the roundup.

At 9 pounds traveling weight, portability isn't outstanding, but it is still quite manageable. The 325NC's 9-inch color screen is relatively small, but it's a huge improvement over monochrome, especially if you're preparing presentations. The 85-key keyboard provides mouse emulation if you press <Fn> and cursor keys simultaneously. Dell's service and support are impeccable and include 24-hour on-site replacement. If you've been dreaming about color, your dream has just come true.

Dell Dimension NL25

★★ ★★ **PROS:** Fast, excellent battery life and power management, biggest screen, great portability, good keyboard **CONS:** Screen is hard to adjust

This $2746 SL system starts with outstanding portability, adds four-star performance and a huge, crisp 9.7-inch-diagonal display (the biggest in the roundup), and tops it all off with 3 hours, 34 minutes of battery life. The 85-key keyboard is almost perfect, and an 8MB RAM capacity is big enough to run *Windows* and a batch of memory-hogging applications.

Service and support for the NL25 are first-rate and include a toll-free support line and technicians who work weekends. There's only one change in Dell's standard package in light of this system's low price: Instead of free on-site service, you must ship the system back to Dell for repair—but the company guarantees it'll get it back to you, repaired, within two working days. Isn't there *some* flaw? Well, adjusting the display perfectly is a bit tricky—but aside from that, the NL25 has what it takes.

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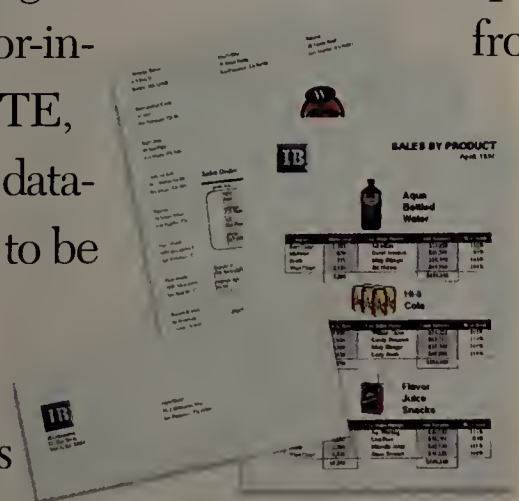

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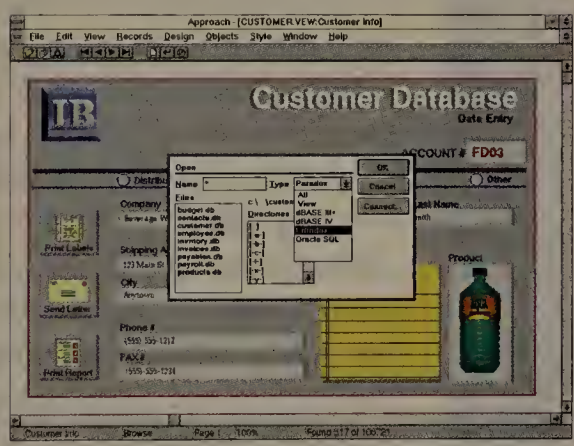

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Circle 27 on reader service card

Notebook Prices Fall Like Dominos

It's a whole new ball game out there, thanks to the domino effect of Compaq's whopping $1240 price cut.

	List price as of July 1992 [1]	Price drop from May 1992
AST Premium Exec 386SX/25	$3544	$325
BCC Avanti 025	$3000	$100
Compaq LTE Lite/25	$3702	$1240
Compudyne Slimline 386SXL/25	$1817	$135
Dell 325NC (color)	$3398	$1099
Dell Dimension NL25	$2297	$449
Epson NB-SL/25	$2977	$1525
Gateway 2000 Nomad 325SXL	$2230	none
Insight 386SXL-25	$1979	$120
Mitac 3027F	$2525	$968
NCR Safari 3170	$3350	$2838
NEC UltraLite SL/25C (color)	$4868	$1865
PC&C Dynova Model SLic3000	$2391	none
Samsung NoteMaster 386S/25	$3047	$325
SunRace HyperBook 2200SX/25	$2992	$320
Swan 386SX/25	$2512	$457
Tandy 3830 SL	$3149	$310
Toshiba T3300SL	$3722	$1785
Twinhead Slimnote 386SXL/25	not available	
USA Flex FlexNote 386SXL	$2349	$110
ZDS Z-Note 325L Model 85	$4299	$349

[1] Price includes 4MB to 5MB RAM, 60MB to 80MB hard disk, 1.44MB internal floppy drive, 2400-bps internal modem, mouse or trackball, Windows, and DOS.

Combine outstanding expandability with top performance, and you've got Epson's NB-SL/25.

Epson NB-SL/25

★★★ **PROS:** Fast, removable hard drive, good power management, huge RAM capacity **CONS:** Large, heavy, pricey

Epson's cream-colored SL notebook is one of the fastest systems we tested: It came in fourth overall, with an impressive first-place finish on the *Windows* test. But the Epson's snazziest expansion feature is a removable hard drive. Not only can you lock up the drive for security, but your company can buy one notebook and give everybody his or her personal drive.

Battery life is only a hair under 3 hours, and you can change batteries without powering down. A handy pop-up monitor shows how much charge is left. There are some minuses, though: This 9.2-pound system is the heaviest in the roundup and one of the bulkiest. The 9.4-inch-diagonal paper-white screen is relatively large, but the display is a bit washed-out and hard to adjust. Finally, at $3534 the NB-SL/25 isn't cheap, and you get only a 60MB drive—Conner's 19ms CP2064. Bottom line: This is a good machine, but you can do better.

Gateway 2000 Nomad 325SXL

★★½ **PROS:** Inexpensive, highly portable, good battery life, big screen **CONS:** Emulated page control keys

The Nomad justifies its moniker by tying for the lightest traveling weight in the roundup: 7.5 pounds. Equally appealing is its low $2230 street price—which includes *Crosstalk for Windows* and *WinFax Pro.* It boasts one of the biggest screens here—a full 9.7 inches diagonally—and sharp, crisp black letters. However, it loses points for awkward push-and-turn brightness and contrast controls. The Gateway's battery life is a full 3 hours, 16 minutes, but you can't change the battery without shutting the system down. Its biggest problem is its 80-key keyboard: Page keys, along with <F11> and <F12>, are emulated.

As is typical of SXLs, the Nomad is not a top performer, but it *is* the fastest of its race. It comes with an 80MB, 16ms Conner CP2084, a handheld trackball, and an expansion bus. If you can live without blazing performance and don't mind the keyboard, the Nomad has a lot going for it.

The Gateway 2000 Nomad 325SXL is as light as any notebook here and includes a big, beautiful screen.

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Circle 182 on reader service card

Insight 386SXL-25

★★ ★½ **PROS:** Inexpensive, very portable, big screen, removable hard drive
CONS: Page keys emulated, screen controls hard to use

Portability and price are the Insight's shining glories. Its $2099 price is the third-lowest in the roundup—and includes a removable hard disk. At 7.6 pounds traveling weight, it's one of the lightest units here. Battery life is decent—only a little under 3 hours—and this notebook boasts a wide range of power options: You can change batteries on the fly, and you can run it with 8 AA batteries.

That said, this picture has some flaws: Performance isn't breathtaking. The big 9.4-inch-diagonal screen is a bit washed-out, and the brightness and contrast controls are nasty little wheels at the right of the screen, hard to set and easy to derange. The 80-key keyboard lacks dedicated page keys. Still, of the three "triplets" in this roundup (the Insight, Samsung, and Swan are virtually identical), the Insight has the lowest price, the best battery life, the best service and support—and the best value.

If a low price is high on your list, Insight's featherweight 386SXL-25 should appeal to you.

PCMCIA: The Notebook Expansion Slot

by TJ Byers

Next to short battery life and awkward keyboards, the commonest notebook complaint is lack of expansion slots. Without them, how can you connect to the office network, a scanner, or that SCSI CD ROM drive?

Thanks to the new Personal Computer Memory Card International Association bus, which is starting to find its way into more and more notebooks, this problem is about to disappear. The PCMCIA bus is a tiny expansion slot that accepts credit card–size adapter boards. Though the physical aspects of the PCMCIA's 68-pin connector have long been defined, specifications for each pin's function are just now being nailed down. Cards that conform to both the PCMCIA 2.0 and the equivalent JEIDA 4-1 standards carry the new Exchangeable Card Architecture (ExCA) symbol—a sign that guarantees operability in all ExCA-compatible systems. Two of the notebooks in this roundup, NCR's Safari 3170 and Toshiba's T3300SL, sport PCMCIA slots.

For now, modems and small storage devices are the only PCMCIA cards available.

Among the first PCMCIA 2.0 cards to appear is a 2400-bps MNP-5 modem from Intel. However, since most notebooks already offer a proprietary modem, this peripheral alone is not likely to establish the slot as a must-have. A much more important PCMCIA peripheral is the flash memory card, manufactured by companies like Intel and Sun River. Flash memory is a type of nonvolatile RAM that can accept data as quickly as a RAM disk and store it permanently like a hard disk—even when the power is off. However, the biggest flash memory card you can get at the moment is 20MB—which limits its usefulness as a portable hard disk. Bigger capacities are in the works.

Vendors also say that PCMCIA cards with SCSI ports, Ethernet and Token-Ring connectors, and remote pager cards will be announced soon. In the meantime, PCMCIA remains a promising technology—and a good way of preparing for the future. Because you can count on one thing: As sure as there's a slot, someone is going to find a way to fill it.

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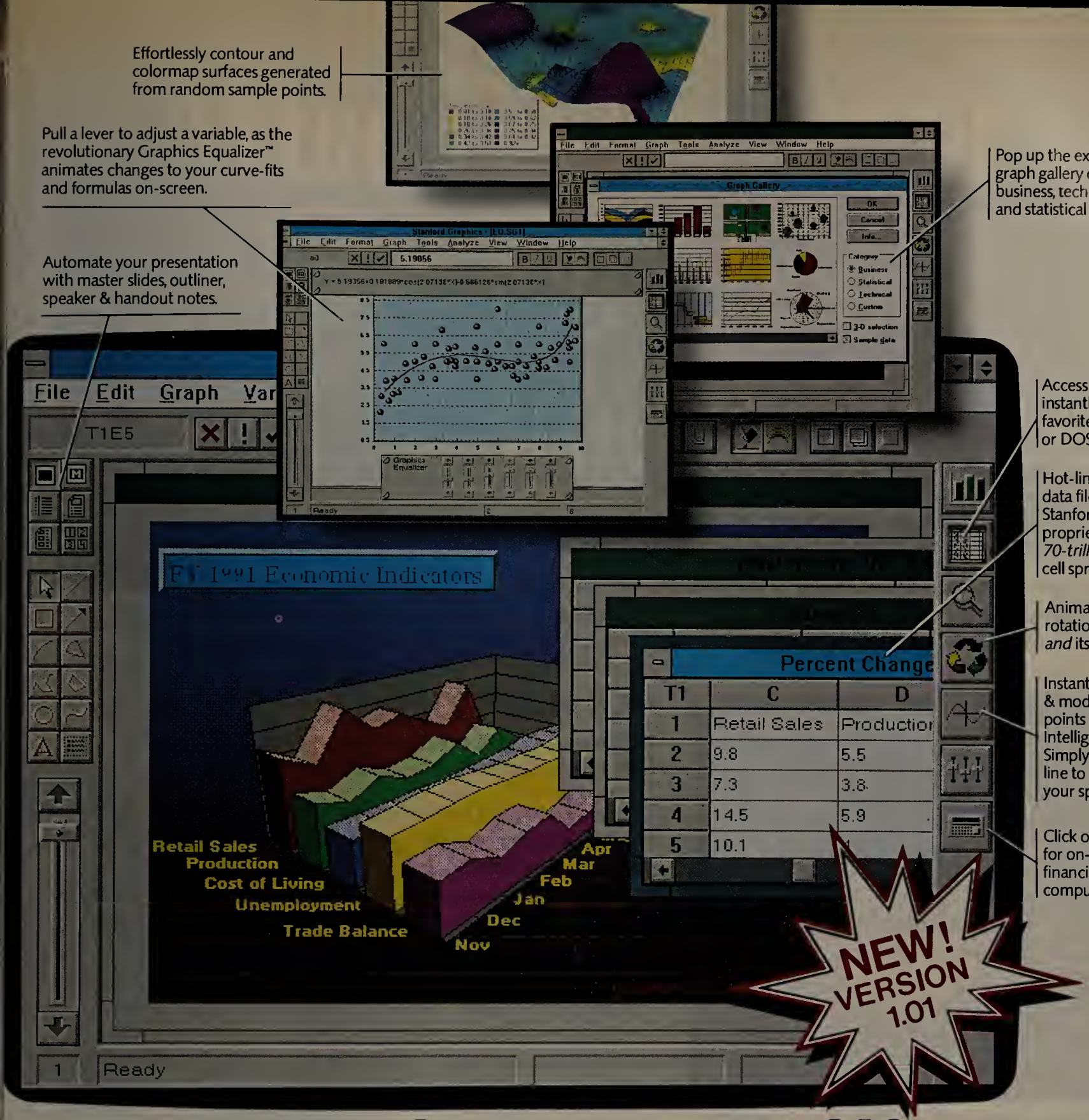

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Circle 309 on reader service card

Mitac 3027F

PROS: Fast, inset screen hinge, security features
CONS: Small screen, awkward design

Looking for four-star performance? Mitac's SL blazes into a first-place finish on the *1-2-3* test. However, $2745 is only a middle-of-the-road price, 8.4 pounds is fairly heavy, and the 3027F is relatively large. The 8.4-inch-diagonal screen is mounted on an inset hinge for easier tray-table operation, but it's nearly the smallest one here, and it's a bit washed-out. Moreover, brightness and contrast controls are little wheels on the left side of the case, where they're sure to be disturbed. The spongy 84-key keyboard didn't impress us either.

For security, the 3027F lets you define passwords that control access to all peripherals. Another nice touch: Its BIOS resides in flash EPROM for easy upgrade. But opening the front latch is awkward, and the power plug is inaccessible behind a plastic hatch cover. Speed fanatics will find the 3027F hard to resist, but the rest of us may want to keep looking.

The top score on our 1-2-3 benchmark certifies Mitac's 3027F as a performance champ.

NCR's fast, elegant Safari 3170 includes a PCMCIA slot and a built-in trackball.

NCR Safari 3170

PROS: Fast, small, PCMCIA slot, built-in trackball, external floppy
CONS: Expensive, short battery life, heavy

The Safari is the only notebook here without a built-in floppy drive. But without the 1-pound external floppy, the Safari is one of the smallest systems here. Moreover, it's fast.

This is an elegant unit, with nice detailing and an LCD panel just below the screen. Unfortunately, at $4702 it's also quite expensive—although you get a PCMCIA slot and a generous software bundle. Battery life is only 2 hours and 21 minutes, and while the 9.3-inch screen is fairly large, it's a bit streaky, and the characters are thin. The 78-key keyboard has a perfect layout with one exception: There are no cursor keys! Instead you get FingerMouse, a handy trackball-like pointing device to the right of the space key. Instead of cursor keys, you press two-key combinations of the mouse and <Fn> buttons. Fortunately, you can reconfigure the mouse keys to work like cursor keys—but we think you can do better.

NEC UltraLite SL/25C

PROS: Active-matrix color, fast, excellent connectivity
CONS: Expensive, short battery life, large, heavy

At just over $6000 on the street, the NEC UltraLite SL/25C is the most expensive machine here, but it's still a good buy. For one, it was the only machine available at press time in this processor class with an active-matrix color screen—a great improvement on all those monochrome LCDs. The UltraLite is also the fastest machine we tested, with especially speedy scores on the *WordPerfect* and *Windows* tests. Finally, the UltraLite is eminently connectable, with ports for an extra keyboard or keypad, an external super-VGA monitor, and a docking station.

Packing all these features into a portable package is not an easy matter—which may be why the UltraLite is the largest machine reviewed, as well as one of the heaviest. But if you're thinking seriously about trading in your desktop for a notebook, the UltraLite's color, speed, and expandability could go a long way toward making the switch easier.

One of two color machines here, the NEC UltraLite SL/25C is also one of the fastest—and heaviest.

What Daddy Never Told You About DOS Communications.

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> –Lotus, *October 1991*

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April 1991
Crosstalk Mk. 4

April 30, 1991
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Circle 84 on reader service card

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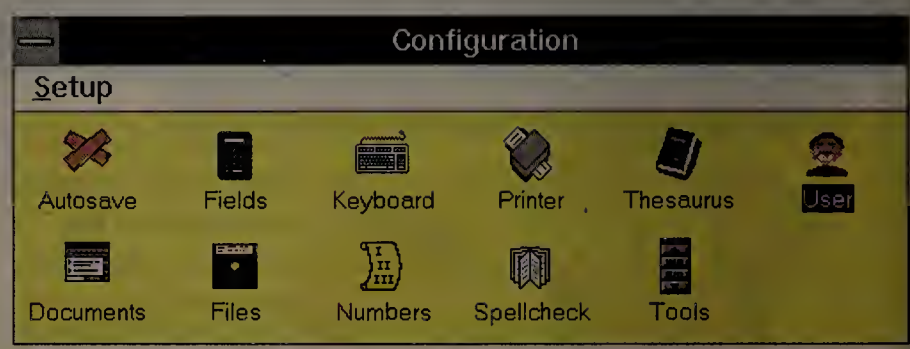

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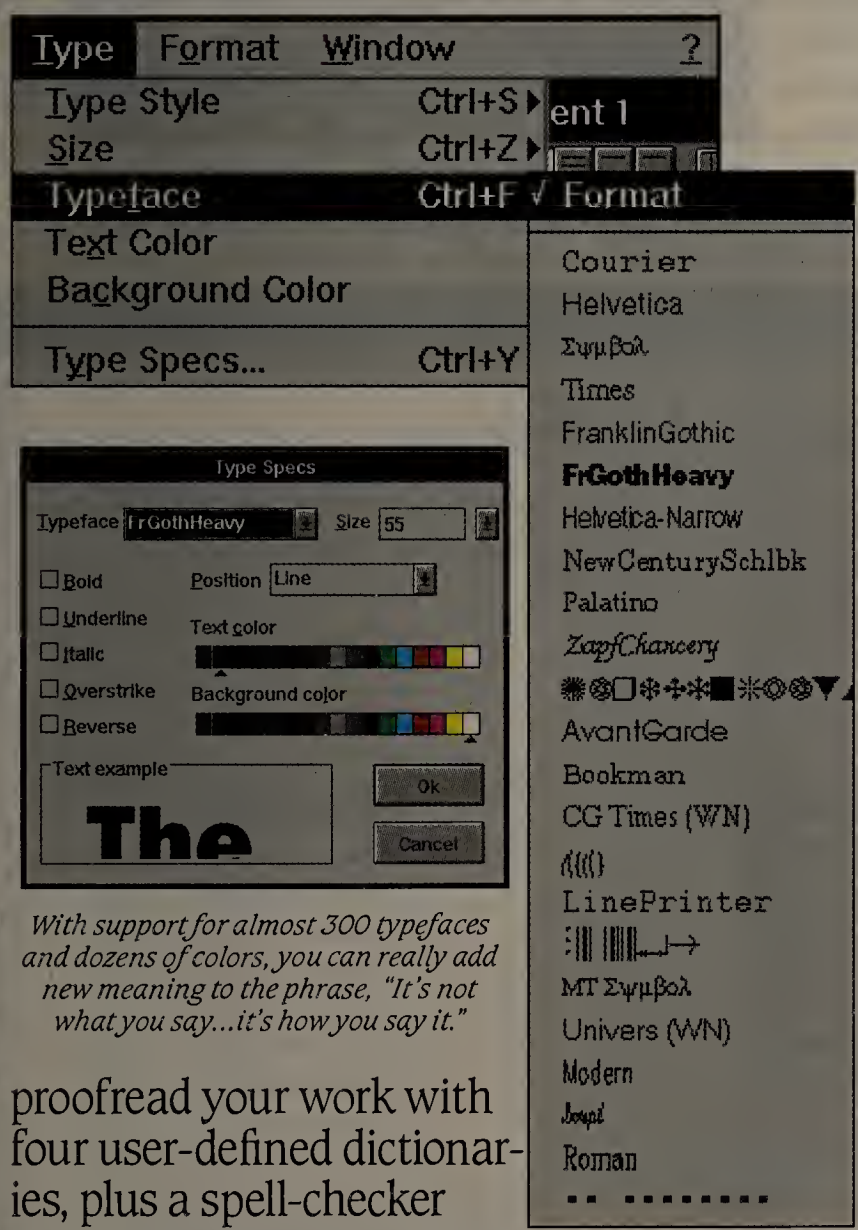

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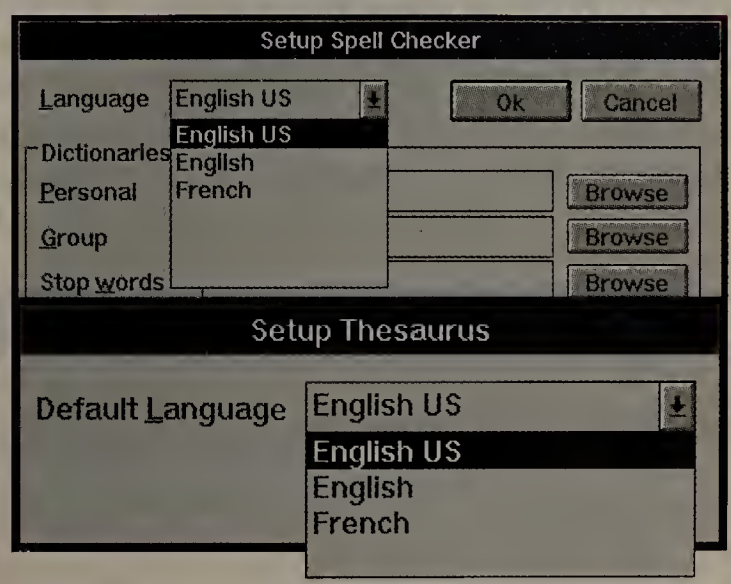

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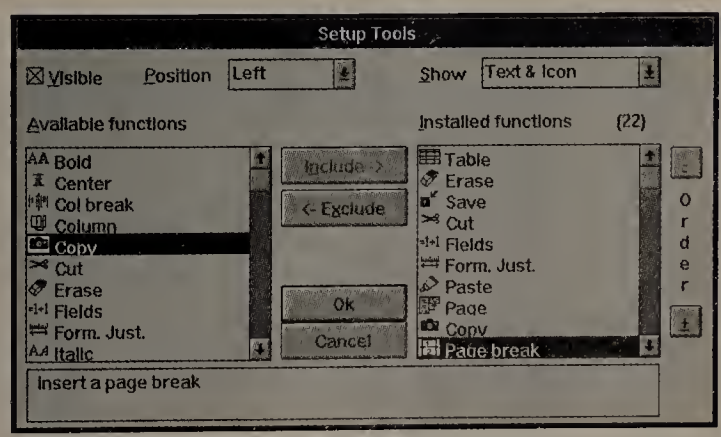

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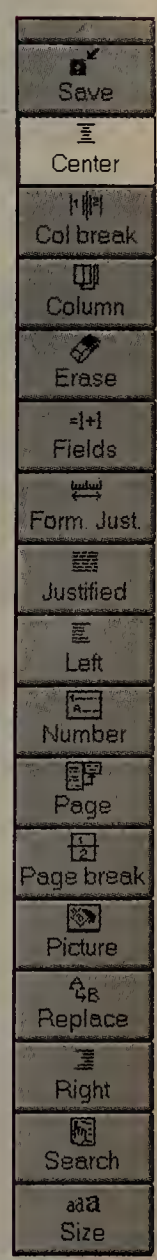

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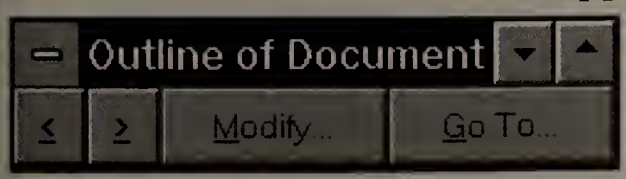

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Circle 26 on reader service card

PC&C Dynova Model SLic3000

PROS: Fast, inexpensive, APM, good power management options
CONS: Heavy, awkward suspend button

Normally you wouldn't expect to get four-star performance from the least expensive system in a review, but that's the case with the PC&C Dynova. At $1937 on the street (and that includes a copy of Delrina's *WinFax* software), it's a steal. The SLic3000 comes with some pretty sophisticated power management too; you can, for example, set timeouts for the floppy drive. It's also one of four systems here that ship with the Intel-Microsoft Advanced Power Management specification in their BIOS.

Unfortunately, APM or no, the SLic3000 managed only a so-so 2 hours and 42 minutes in our battery tests. Also, the machine feels clunky. At 9 pounds it was one of the heaviest we looked at. And though the case and keyboard are otherwise nicely laid out, the recessed suspend button is too small for human fingers to depress. Still, if you're sensitive about price but don't want to give up speed, this could be the right machine for you.

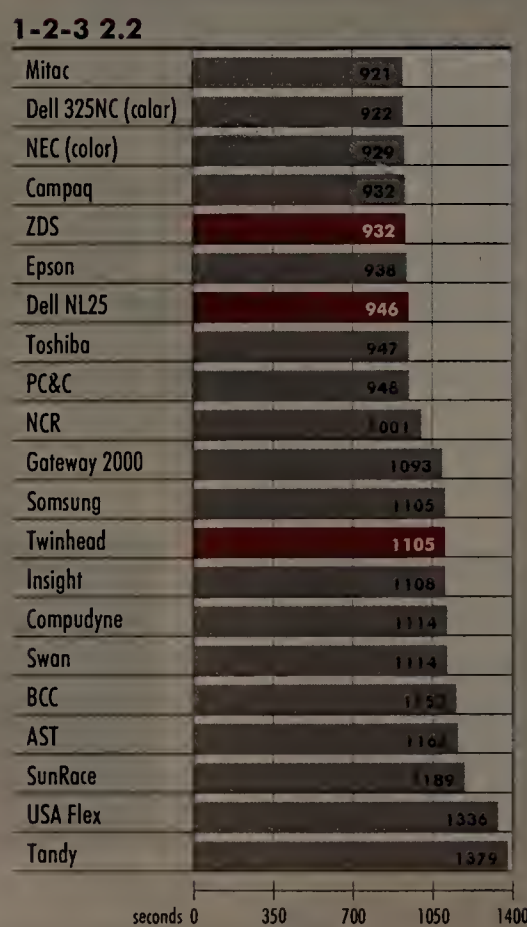
The fast, affordable PC&C Dynova Model SLic3000 is one of four APM-ready machines we reviewed.

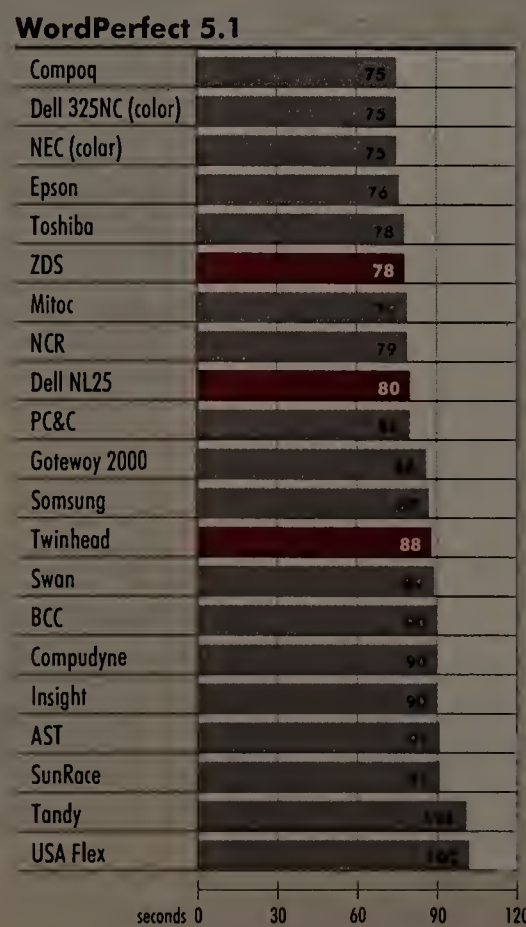
PC WORLD TEST REPORT

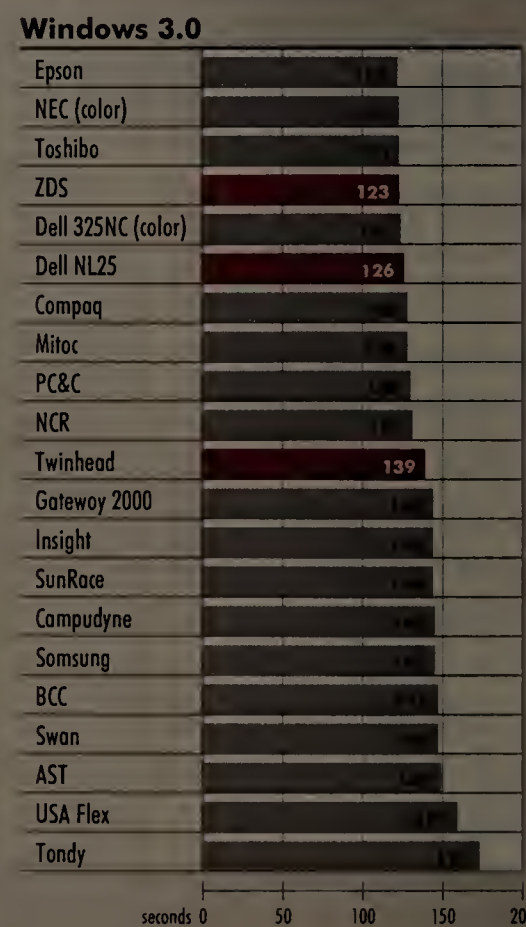
25-MHz 386 Notebooks: Fast Enough for Any Desktop

Our two color notebooks, Dell's 325NC and NEC's UltraLite SL/25C, placed close to the top in every test—with the ZDS Z-Note 325L Model 85 doing nearly as well. In general, SL notebooks tested faster than SXLs. That's because the SL's built-in cache controller makes it easier to support a cache—and all the SL systems have a cache.

BEST BUY







Samsung NoteMaster 386S/25

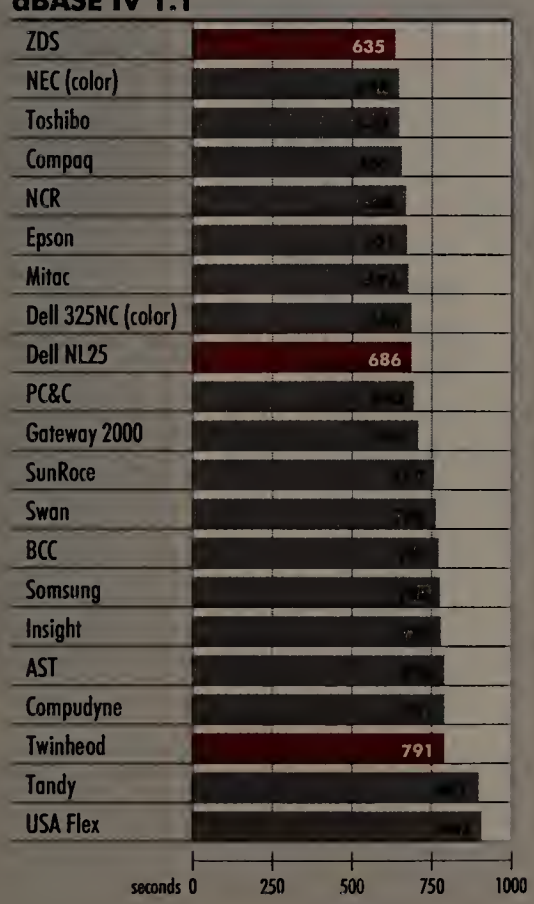
★★★ **PROS:** Lightweight, compact, removable hard drive, alkaline battery option
CONS: Short battery life, limited power-saving options

Like the virtually identical notebooks from Insight and Swan, the NoteMaster's strong suit is portability. It's light (7.6 pounds) and small (its 8.5-by-11-inch frame is less than 2 inches high). Like the other two, it comes with a removable hard drive and an alkaline battery option, and it lets you change batteries in suspend mode. Unfortunately, the NoteMaster also shares the other two's poorly designed display controls and their lack of an expansion chassis and a PCMCIA slot.

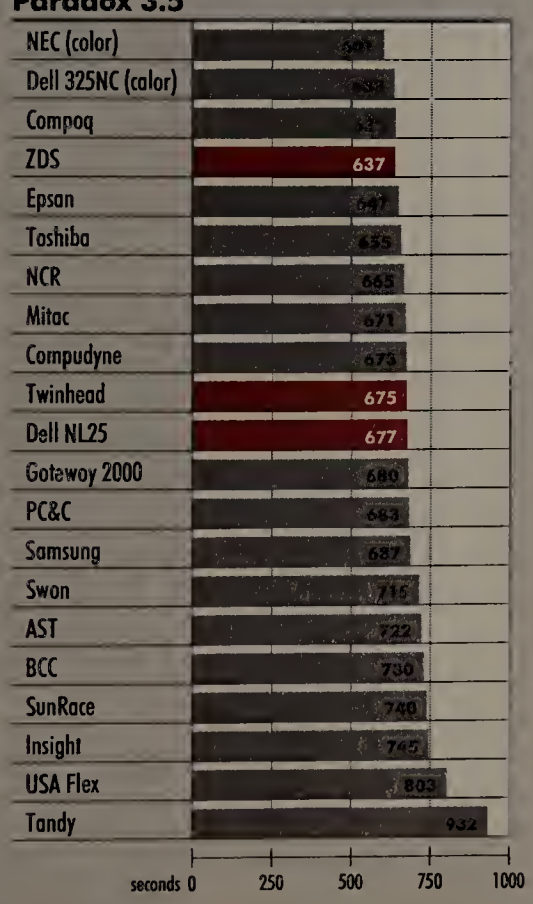
There are some differences between this machine and the other two. With 2 hours and 27 minutes of battery life, the Samsung falls squarely between the other two. At $2587 on the street, the NoteMaster almost splits the others on price. Without a turnaround or replacement policy, the Samsung loses out to the Insight for service. As a result, in the battle between the triplets, the Samsung ties for second with the Swan.

Lightweight, small in size, with a removable hard drive—the Samsung is easy to carry around.

dBASE IV 1.1



Paradox 3.5



Methodology
We tested all the computers with 4MB RAM. The systems' hard disks ranged from 60MB to 80MB. We used the vendor's version of DOS or MS-DOS 5.0.

1-2-3 2.2
We load the application, followed by three separate worksheets (arithmetic, financial, and scientific). We make various changes and run recalcs on each. Finally, we use the *MAPS* add-in from Management Advisory Services of Seattle to run a number of financial forecasts.

WordPerfect 5.1
We reformat three *WordPerfect 5.1* documents that vary in size from 5K to 55K. The files are text with some boldface and underlining. One document includes a TIFF image.

Windows 3.0
Timing begins and ends at the DOS prompt. We launch *Windows* along with a macro that loads *Microsoft Excel* with a financial worksheet and initiates a recalc. Then the macro loads Lotus's *Ami Pro* along with a 50K document that contains a 500K TIFF image. Finally, the macro launches *Micrografx Designer*, opens a drawing, displays it on screen, and exits to DOS.

dBASE IV 1.1
With the caching feature enabled, we complete an unindexed search for a single record in a 100,000-record parts table. Then we index the table, run the transaction processing module, and post 600 records.

Paradox 3.5
Starting with an orders table, we compare each record with an available stock table. The application finds the current price for the items and inserts the resulting record into an invoice table.

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Smart Software Extends Battery Life

by TJ Byers

There's no secret about how to extend the life of your notebook's battery: Turn off as many subsystems (like backlighting and disk drives) as you can. Most notebooks let you do this by setting timeouts, but it can slow your work—especially if the timeouts think the subsystems should be turned off just when you need them.

Fortunately, battery life can be extended much further (and with much less inconvenience to you) by letting individual applications decide when the CPU should slow down or speed up and when peripherals should turn off or on. Advanced Power Management (APM) is a new, intelligent power-saving specification developed by Intel and Microsoft that does just that. It requires an APM-compatible BIOS, DOS 5.0, *Windows 3.1*, and a chip set that can monitor system activity and components for power-down opportunities. (Most SL- and SXL-based notebooks have this chip set, and others do as well.) To find out if your notebook has APM, just click on *Windows'* Control Panel. If APM is available, you'll see a special power management icon.

You'll also need a CONFIG.SYS driver. This driver, which should be available from the notebook vendor, provides a limited amount of power management control for all DOS and/or *Windows* applications right off the bat. Typically, it might slow or stop the CPU between keystrokes or suspend *Windows* after a given period of inactivity. Incidentally, this level of power saving is already available from some notebooks *without* APM.

The full impact of APM won't be realized until APM-aware software becomes available. In a typical scenario, *Excel* might save battery power by throttling down the CPU to 2 MHz during data entry, bringing it back to full speed (but turning off the backlighting) for a recalc, and firing up the hard disk only when required. At press time we'd heard of only two applications that are being rewritten to support APM: *Excel* and *Quattro Pro*. But inevitably there will be more.

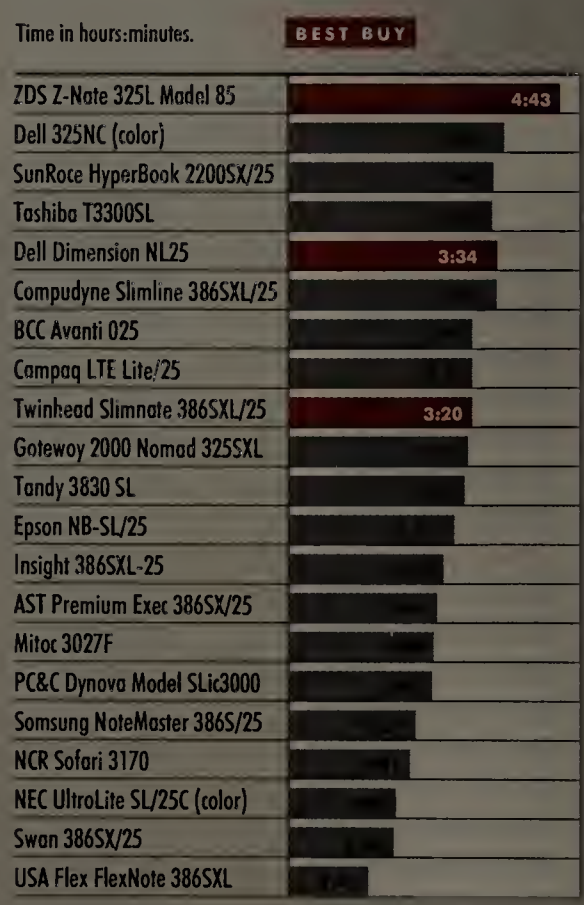
It's possible to upgrade older notebooks to APM compatibility by installing a new BIOS chip. If your notebook stores its BIOS in flash EPROM, you can upgrade easily by downloading the new BIOS code, along with the vendor's APM drivers, from a bulletin board. You'll still need *Windows 3.1* and DOS 5.0, of course.

How much of a difference will APM make? Industry sources tell us that users can expect an average 25 percent saving over normal battery life—but only time will tell, since no APM-aware applications have been released yet. And until the applications emerge, APM is merely a great idea waiting to happen.

PC WORLD TEST REPORT

Battery Life: Breaking the 3-Hour Barrier

Improved power management software, new battery technology, and low-voltage CPUs help you work longer, even when AC power is far away. No fewer than 11 of these systems break the 3-hour barrier, with ZDS's Z-Note 325L Model 85 turning in a fine time of 4:43.



Methodology
We run an application with built-in pauses of fixed duration. The notebook's power-saving features are set as follows: hard disk timeout at 2 minutes, display timeout at 5 minutes, deepest sleep mode at 10 minutes.

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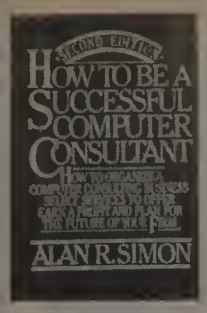

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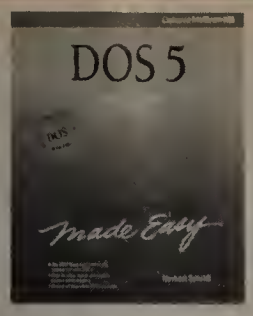

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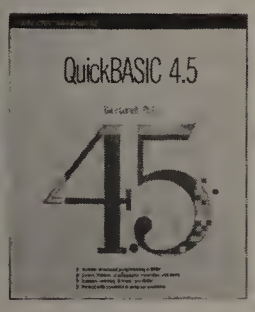

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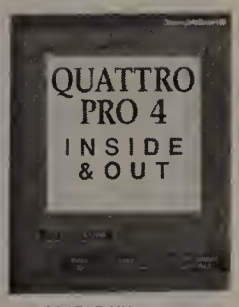

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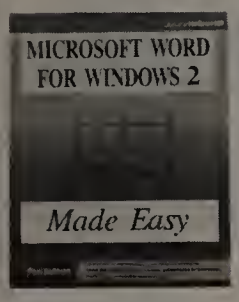

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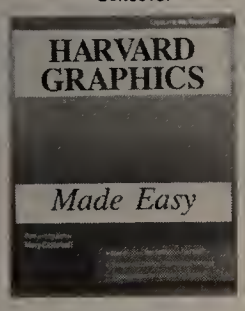

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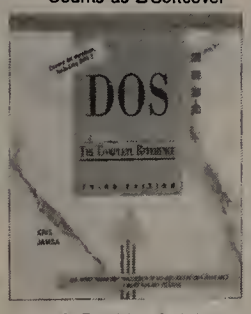

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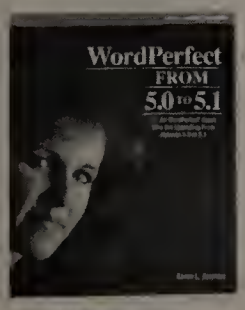

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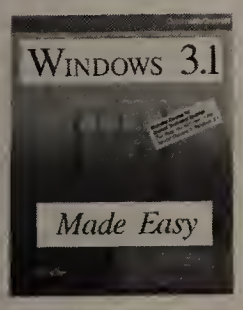

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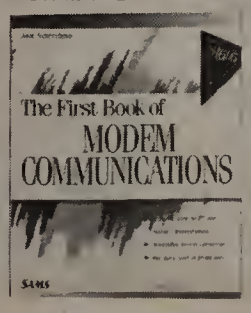

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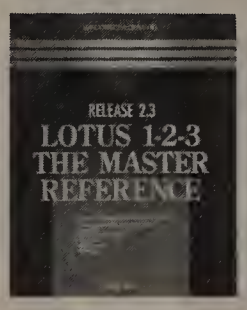

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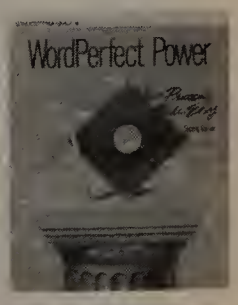

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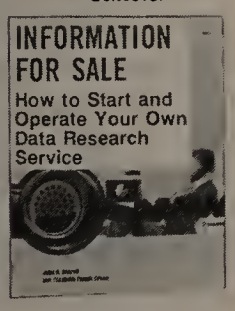

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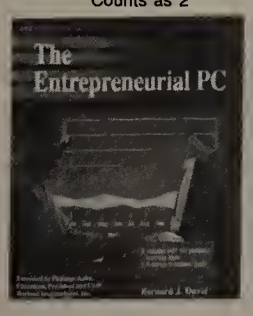

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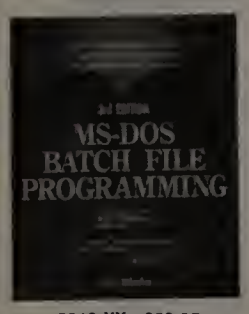

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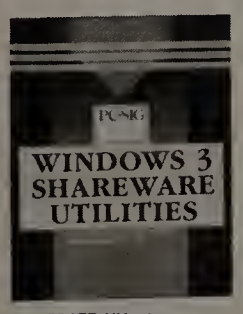

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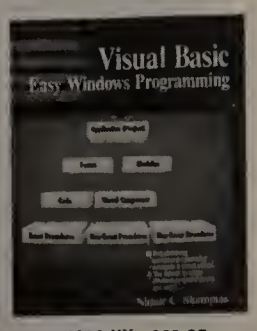

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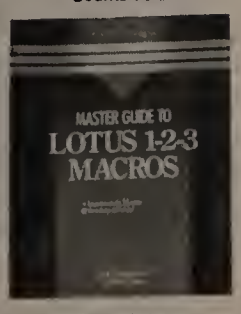

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SunRace HyperBook 2200SX/25

PROS: Low price, light, long battery life, alkaline battery option
CONS: Awkward keyboard

For only $2321, the SunRace HyperBook gives you a passel of interesting features. The front panel has an LED bar graph to indicate battery life. The photo sensor on top of the display panel automatically adjusts brightness according to ambient light—meaning the display uses less power. The batteries lasted an impressive 3 hours and 40 minutes in our tests, and you get the option of using alkaline batteries.

Other features, however, particularly the keyboard, are more in keeping with the SunRace HyperBook's lowball price. There's no suspend button nor dedicated page control keys, the cursor keys are arranged in a nonstandard configuration, and the keys rattle. Also, this SXL is one of the slowest machines in the roundup as well as one of the bulkiest. Still, if price is your major concern and you can get used to the keyboard, the HyperBook could be easy to love.

The low-priced HyperBook has some innovative features and excellent battery life.

As with the Insight and the Samsung, the Swan's strong suit is portability.

Swan 386SX/25

PROS: Lightweight, compact, removable hard drive, alkaline battery option
CONS: Short battery life, limited power management

The Swan 386SX/25 is, with a few exceptions, just like the Insight and the Samsung, since they're the same Samsung-built machine with different name tags. Like its siblings, the Swan 386SX/25 excels at portability: It's a light 7.6 pounds, and it's extremely compact. It also has that removable hard drive, the ability to change batteries on the fly, and the option of alkaline batteries.

However, the Swan has some problems all its own. Batteries lasted just over 2 hours in our tests, the worst of the three systems. At $2969 the Swan is also the most expensive of the three. Finally, unlike Insight (and like Samsung), Swan has no turnaround policy for repairs. If you're looking for a notebook that's easy on the shoulder when running between flights, any one of these three machines is worth considering; of the three, however, the Swan and the Samsung take second place to the Insight.

Tandy 3830 SL

PROS: Lightweight, large screen
CONS: Slowest machine in review

Despite the fact that the 3830 SL uses Intel's SL chip, it still came in dead last in our performance tests—behind all the SXL-based machines. At press time, Tandy was rehauling the system's BIOS. But until we can test an upgraded system, we'll have to stick with the results we got.

Despite the slow speed, the Tandy has its good points. It's one of only three machines to weigh in at 7.5 pounds—a tie for lightest in the review. Its huge screen measures 9.7 inches across the diagonal, one of the biggest we looked at—and you can use the LCD and a super-VGA external monitor at the same time. The keyboard is full featured, with standard inverted T cursor keys, dedicated page control and function keys, and a trackball. Should you wish to upgrade the BIOS (and we certainly did), the flash ROM BIOS will make it easy. But until the company completes the firmware rewrite, it's hard to recommend the 3830 SL.

Despite its SL chip, Tandy's 3830 SL was the slowest machine in the roundup.

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Circle 183 on reader service card

FEATURES EVALUATION

25-MHz Notebooks Close In on Desktop Systems

With hard drives at 120MB and rising, perfect keyboards, PCMCIA expansion slots, and big, beautiful displays (two of them full color), the best of these 386 notebooks are as capable as any desktop PC.

● Yes
○ No
n/a = not applicable

	AST Premium Exec 386SX/25	BCC Avanti 025	Compaq LTE Lite/25	Compudyne Slimline 386SXL/25	Dell 325NC (color)	Dell Dimension NL25	Epson NB-SL/25	Gateway 2000 Nomad 325SXL	Insight 386SXL-25
Standard features									
Street price 5/29/92[1]	$3480	$2999[2]	$4306	$1952[3]	$4497	$2746	$3534	$2230[4]	$2099
List price 5/29/92[1]	$3869	$3100[2]	$4942	$1952[3]	$4497	$2746	$4502	$2230[4]	$2099
Processor	AMD 386SXL/25	AMD 386SXL/25	Intel 386SL/25	AMD 386SXL/25	Intel 386SL/25	Intel 386SL/25	Intel 386SL/25	AMD 386SXL/25	AMD 386SXL/25
Memory cache (K)	0	0	16	0	64	64	64	0	0
Hard disk type/size	IDE/80MB	IDE/80MB	IDE/80MB	IDE/60MB	IDE/80MB	IDE/80MB	IDE/60MB	IDE/80MB	IDE/80MB
Hard disk average access time	19ms	19ms	19ms	19ms	19ms	19ms	19ms	19ms	19ms
Portability									
Traveling weight (pounds)	8.9	8	7.7	7.8	9	8.1	9.2	7.5	7.6
Dimensions (inches)	2.2 x 10.4 x 8.6	1.7 x 11 x 8.5	1.8 x 11 x 8.5	1.7 x 11 x 8.5	2.3 x 8.5 x 11	1.8 x 11 x 8.3	2 x 11.7 x 9.2	1.8 x 11 x 8.5	1.8 x 11 x 8.5
Power management									
Battery life (hours)	2:47	3:20	3:20	3:33	3:40	3:34	2:53	3:16	2:53
Indicator shows full charge	●	●	●	●	●	●	●	●	●
APM	○	●	○	○	○	●	○	○	○
Suspend button/timed suspend	●/●	●/●	●/●	●/●	●/●	●/●	●/●	●/●	●/●
Expandability									
RAM capacity (MB)	8	8	10	6	12	8	20	6	8
Largest hard disk option (MB)	120	130	120	80	120	80	120	80	120
Removable hard drive	○	○	○	○	○	●	●	○	●
Internal modem available	●	●	●	●	●	●	●	●	●
PCMCIA slot	○	○	○	○	○	●	○	○	○
Display									
Screen (diagonal)	8.4	9.4	9.5	9.4	9	9.7	9.4	9.7	9.4
Super-VGA compatible	○	○	○	●	●	●	○	●	○
Simultaneous LCD and CRT	○	○	●	●	○	●	●	○	○
Keyboard									
Cursor keys in inverted T	●	○	●	●	●	●	●	●	●
Dedicated page control keys	●	○	●	●	●	●	●	○	○
All 12 function keys dedicated	○	○	○	○	●	●	●	○	○
Built-in trackball	○	○	○	●	○	●	○	○	○
Service and support									
Warranty (months)	12	12	12	12	12	12	12	12	12
On-site service/under $100	●/○	○/○	●/●	○/○	●/●	● ●	○/○	○/○	○/○
Turnaround policy	24 hours	72 hours	none	24 hours	24 hours[11]	48 hours	48 hours	none	72 hours
Vendor support									
Central support/toll-free	●/●	●/●	●/●	●/●	●/●	●	●/●	●/●	●/●
Daily support (hours)	14	9	12	9	15	15	15	18	15
Weekend support	●	○	○	○	●	●	○	●	●
BBS/fax	●/●	●/●	●/○	●/●	●/●	●	○/○	●/●	○/●
						BEST BUY			

[1] Except as noted standard system configuration includes 4MB RAM, 60MB to 80MB hard disk, 1.44MB internal floppy drive, 2400-bps internal modem, mouse or trackball, Windows, and DOS. We include a fair estimated cost for components not provided.
[2] Includes WinFax, Terminal Plus, Magic Cursor.
[3] Includes PackRat.
[4] Includes Crosstalk for Windows, WinFax Pro.

	Mitac 3027F	NCR Safari 3170	NEC UltraLite SL/25C (color)	PC&C Dynova Model Slic3000	Samsung NoteMaster 386S/25	SunRace HyperBook 2200SX/25	Swan 386SX/25	Tandy 3830 SL	Toshiba T3300SL	Twinhead Slimnote 386SXL/25	USA Flex FlexNote 386SXL	ZDS Z-Note 325L Model 85
	$2745	$4702[5]	$6006[6]	$1937[7]	$2587	$2321	$2969	$2802[8]	$4417	$2674	$2459[9]	$3578
	$3493	$6188[5]	$6733[6]	$2391[7]	$3372	$3312	$2969	$3459	$5507	not available	$2459[9]	$4648
	Intel 386SL/25	Intel 386SL/25	Intel 386SL/25	Intel 386SL/25	AMD 386SXL/25	AMD 386SXL/25	AMD 386SXL/25	Intel 386SL/25	Intel 386SL/25	AMD 386SXL/25	AMD 386SXL/25	Intel 386SL/25
	16	64	64	64	0	0	0	16	64	0	0	64
	IDE/80MB	IDE/80MB	IDE/80MB	IDE/80MB	IDE/60MB	IDE/80MB	IDE/80MB	IDE/80MB	IDE/80MB	IDE/60MB	IDE/80MB	IDE/80MB
	19ms	16ms	19ms	19ms	19ms	17ms	19ms	19ms	16ms	19ms	19ms	19ms
	8.4	8.6[10]	9	9	7.6	7.9	7.6	7.5	7.7	7.8	7.5	8.3
	1.9 x 11.2 x 9.2	1.8 x 11 x 8.1	2.4 x 9 x 11.5	2 x 11.3 x 8.5	1.8 x 11 x 8.5	2.2 x 11 x 8.7	1.8 x 11 x 8.5	1.7 x 11.7 x 8.7	1.8 x 11.7 x 8.3	1.7 x 11 x 8.5	1.8 x 11.6 x 8.4	1.9 x 11.9 x 8.5
	2:44	2:21	2:08	2:42	2:27	3:40	2:06	3:13	3:39	3:20	1:42	4:43
	●	○	●	●	●	●	●	●	●	●	●	●
	○	○	○	●	○	○	○	●	○	●	○	●
	●/●	●/●	●/●	●/●	●/●	○/●	●/●	●/●	○/●	●/●	●/●	●/●
	10	20	10	8	8	8	8	8	18	6	9	12
	120	120	120	130	120	130	120	80	120	130	120	120
	○	○	○	○	●	○	●	○	○	●	○	●
	●	●	●	○	●	○	●	●	●	●	●	●
	○	●	○	○	○	○	○	○	●	●	○	●
	8.4	9.3	9.5	8	9.4	8.8	9.4	9.7	9.6	9.4	8.5	9.4
	●	○	●	●	○	●	○	●	○	●	○	●
	○	○	●	○	●	○	○	●	○	●	○	●
	●	○	●	●	●	○	●	●	●	●	●	●
	●	●	○	○	○	○	○	●	●	●	●	●
	○	○	●	●	○	○	○	●	●	●	○	●
	○	●	○	○	○	○	○	●	○	●	○	●
	12	12	24	12	12	15	12	12	12	12	12	12
	○/○	●/○	○/○	○/○	○/○	○/○	○/○	●/○	●/●	●/●	○/○	●/●
	1 week	96 hours	none	48 hours	none	24 hours	none	48 hours	48 hours	96 hours	48 hours	48 hours
	●/●	●/○	●/●	●/○	●/●	●/●	●/●	●/○	●/●	●/●	●/●	●/●
	10	8	10.5	12	8.5	10	12	9	10	11	24	12
	○	○	○	○	○	○	●	○	○	●	●	●
	●/○	○/●	●/●	○/●	●/○	○/○	●/●	●/●	●/○	●/●	○/●	●/●
										BEST BUY		BEST BUY

[5] Includes Windows Productivity Pack, AT&T Access Plus.
[6] Includes PFS:WindowsWorks.
[7] Includes WinFax.
[8] Estimated.
[9] Includes 5MB of RAM.
[10] Includes external floppy drive.
[11] On-site replacement.

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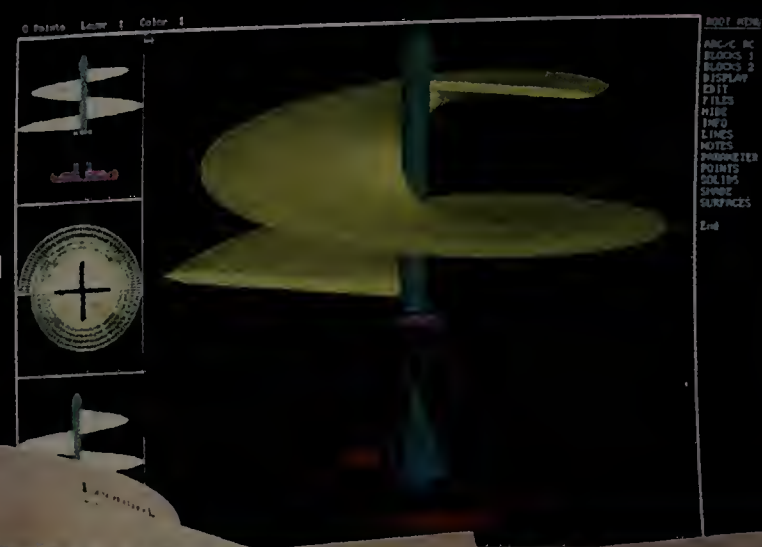

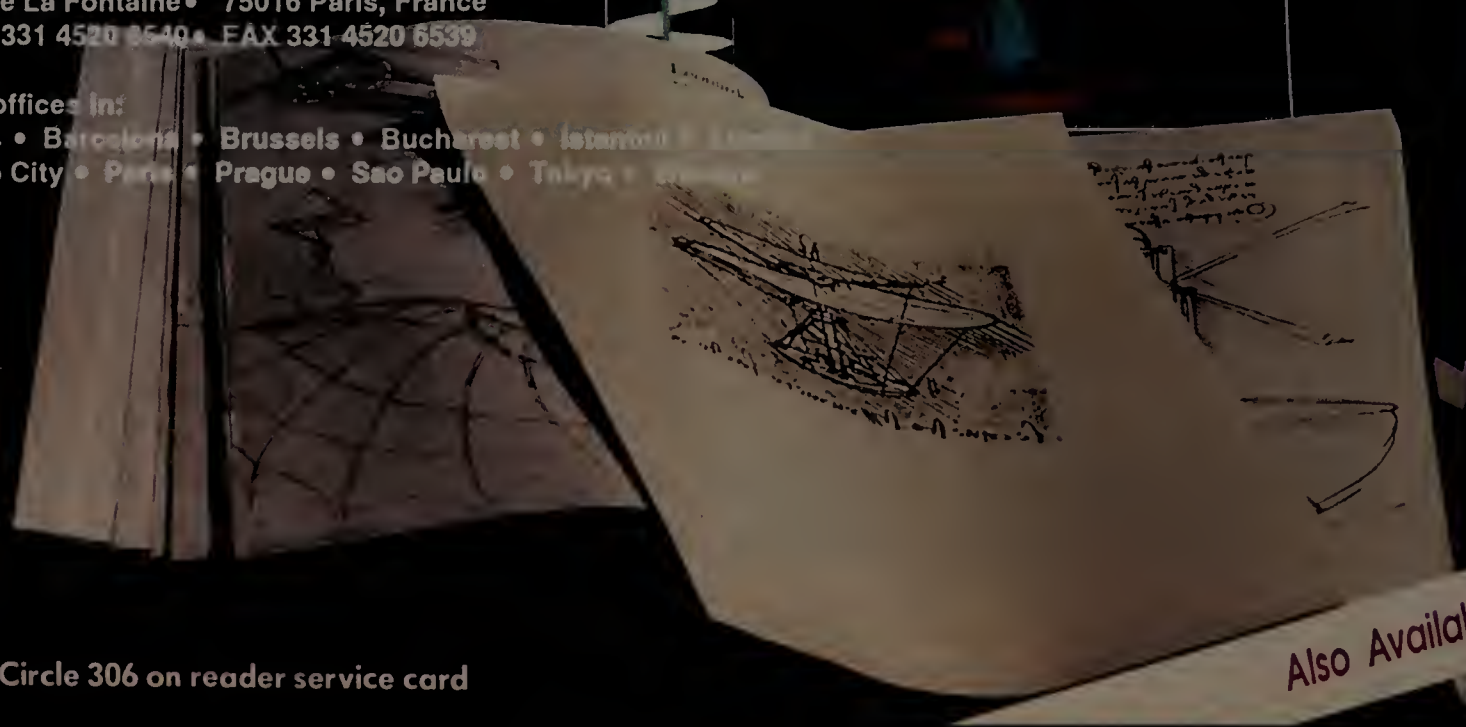

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Circle 306 on reader service card

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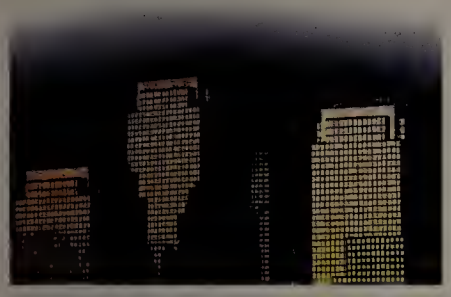

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Circle 101 on reader service card

Previews: Everex, Kris, and Leading Edge

With all the new 25-MHz SL and SXL notebooks rolling off production lines around the world, we can't keep up. Several important new machines arrived in our offices too late for performance and battery testing and street price research, but rather than omit them, we've elected to take a look at them here.

These new SL- and SXL-based notebooks from Everex, Leading Edge, and Kris arrived too late for testing.

Everex Carrier SL/25

Judging on specs alone, without the benefit of benchmarks, we'd bet Everex's new Carrier SL/25 is a speedy little machine.

Other signs of intelligent design are also to be found here. The hard drive and battery are accessible from the front of the machine; their push-button releases are large and easy to operate, which makes swapping batteries and hard drives literally a snap. Everex has also provided digital brightness and contrast controls, which you adjust with keys rather than little wheels or slides; a built-in speaker and microphone (though there's no driver for the microphone yet); a well-positioned trackball; and the option of configuring the note to turn on when you open the lid. The dark-gray case is compact (8.5 by 11 and only 1.8 inches high), and the keyboard feels solid, with good key travel and no rattle.

We wish the Carrier had dedicated page control keys, genuine <F11> and <F12> keys, and a standard <Alt>-<Ctrl> layout and that you didn't have to press two-key combinations to turn the machine on and off and to adjust brightness and contrast. Still, at around $2700 for an 80MB system, this is a very attractive machine.

Leading Edge N3/SL25 Color

Leading Edge's N3/SL25 Color notebook is a promising candidate for combined desktop and portable use. It's based on the SL chip and comes with a 32K cache, so it should perform well. The passive-matrix color screen produces a clear 16 colors at 640 by 480 resolution—maybe not as good as your current desktop monitor, but good enough for *Windows*. For the $3499 list price (not bad for a color note), you also get an Adaptec SCSI adapter and enhanced parallel port, which should speed communications with your office network.

On the downside, the N3/SL25's storage capacity is limited—you get a choice of a 60MB or 80MB hard drive. But if you're looking for a color notebook that can work in the office as well as on the road, the Leading Edge is worth checking out.

Kris Master 386SXL-25

This SXL machine lists for $2095 with an 80MB hard disk, which is quite inexpensive—and we expect street pricing to be at least $100 less. Moreover, the system comes with a Logitech mouse and *Windows 3.1*. Portability is only average: At 8.4 pounds traveling weight and 200 cubic inches, the Master falls in the middle of the pack—but in our roundup, that's still fairly light and sleek. Its small screen measures only 8.5 inches across the diagonal, and letters could be crisper and darker. On the other hand, dedicated keys just below the screen let you adjust contrast, image reverse, and even the position of text on the screen with the greatest of ease. Expandability is impressive too: You can install up to 16MB of memory, an AT expansion bus is built-in, and Kris will sell you a three-slot expansion box.

We can safely predict—based on the machine's SXL processor and lack of a memory cache—that blazing performance is unlikely. And the keyboard is a bit problematic: There are no dedicated page keys, and the <Caps Lock> and <Ctrl> keys are reversed. However, the Kris's low price and high expandability provide compelling reasons to take a closer look.

Toshiba T3300SL

★★ ½ **PROS:** Fast, lightweight, long battery life, PCMCIA slot
CONS: Expensive

As one of the pioneers of portable computing, Toshiba knows how to cram features and performance into small packages. That may explain the T3300SL's blend of portability (7.7 pounds), expandability (a PCMCIA slot and room for 18MB of RAM), and speed (this four-star performer tied for second on our *Windows* test and was near the top on others).

The T3300SL also gives you some features you couldn't get on earlier Toshiba notes. You can set timeouts for the floppy drive as well as the hard disk and display. There's a gas gauge–style battery indicator and a pop-up power management screen. The result of all these power-saving features: 3 hours and 39 minutes of battery life. Of course, the Toshiba pedigree doesn't come cheap: This is the second-most-expensive monochrome system here. Still, if cachet and attractive features are more important to you than saving money, this system is a very attractive package.

Toshiba knows notebooks—and it shows in the light, expandable (and pricey) T3300SL.

The fastest of the SXLs, the Best Buy Twinhead is small and light and delivers excellent battery life.

Twinhead Slimnote 386SXL/25

★★ ★★ **PROS:** Lightweight, compact, excellent screen
CONS: Low RAM capacity

This SXL notebook from Twinhead is almost identical to the Compudyne Slimline. The differences are that the Twinhead has a bigger optional hard disk, can wake up from suspend mode when the modem rings, offers an optional expansion chassis, and has better service and support. At $2674 on the street, it costs about $700 more than the Compudyne, but it's still cheaper than every SL-based system but one.

Though not as fast as most of the SLs, the Twinhead is fairly fast compared with the other SXLs, ties for the smallest machine here, and weighs just 7.8 pounds. Its batteries lasted a generous 3 hours, 20 minutes. Our only quibbles with the system (besides performance) are its 6MB RAM capacity and its trackball's position above the keyboard. Still, long battery life and mobility make it the Best Buy for those who value portability more than power.

PC WORLD BEST BUY

USA Flex FlexNote 386SXL

★★ ½ **PROS:** Lightweight, low price
CONS: Slow, short battery life, small screen

The FlexNote is a lightweight machine in more ways than one. For one thing, at 7.5 pounds it's one of the lightest notebooks we looked at. Also, its small $2459 price is no great burden.

Unfortunately, the FlexNote is also a real lightweight in a few departments where that quality is less desirable, such as performance: The system came in last or next to last on every one of our tests. Power management is weak too: The system managed to stay alive less than 2 hours in our battery tests, the shortest time of any machine reviewed. The screen is small, and your options for using an external monitor are limited—you can't display on a super-VGA screen, and you can't run a monitor and the LCD at the same time. If portability is your only concern, you might want to give the FlexNote a closer look; however, you could find other equally portable machines that aren't so light on features or performance.

The FlexNote is light, small, and inexpensive—but it's also awfully slow.

ZDS Z-Note 325L Model 85

PROS: Long battery life, fast, includes network hardware
CONS: Expensive

The ZDS Z-Note has everything you need in a notebook. Overall, it was the third-fastest system we tested, and it came in first on our *dBASE* test. With a battery life of 4 hours and 43 minutes, it outlasted the nearest competitor by over an hour. The Z-Note's also highly connectable: It comes with a built-in Ethernet port and preinstalled networking software. Finally, the Z-Note has a wonderfully usable keyboard with all the keys right where they should be—and none left out.

Of course, all these abilities don't come cheap. The Z-Note costs about 36 C-notes on the street, $3578, putting it close to the top of the price list. Even so, this winning combination of fast performance, long battery life, connectivity, and a high-quality keyboard will make the Z-Note equally at home on your desk and on the road—and that makes it an easy call as Best Buy.

The speedy Best Buy ZDS Z-Note 325L Model 85 comes with network connections already installed.

WHERE TO BUY

AST Premium Exec 386SX/25
AST Research Inc.
16215 Alton Pkwy.
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800/876-4278,
714/727-9355 (fax)
Reader service no. 680

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BCC
1610 Crane Ct.
San Jose, CA 95112
800/827-4222,
408/944-9000
Reader service no. 681

Compaq LTE Lite/25
Compaq Computer Corp.
P.O. Box 692000
Houston, TX 77269
800/345-1518
Reader service no. 682

Compudyne Slimline 386SXL/25
Compudyne Inc.
15151A Surveyor Blvd.
Addison, TX 75244
800/932-2667,
214/702-5600
Reader service no. 683

Dell 325NC, Dell Dimension NL25
Dell Computer Corp.
9505 Arboretum Blvd.
Austin, TX 78759
800/289-3355,
800/727-8320 (fax)
Reader service no. 684

Epson NB-SL/25
Epson America, Inc.
20770 Madrona Ave.
Torrance, CA 90503
800/922-8911,
310/782-0770
Reader service no. 685

Everex Carrier SL/25
Everex Systems, Inc.
48431 Milmont Dr.
Fremont, CA 94538
800/821-0806,
510/498-1111
Reader service no. 686

Gateway 2000 Nomad 325SXL
Gateway 2000
610 Gateway Dr.
North Sioux City, SD
57049
800/523-2000,
605/232-2023 (fax)
Reader service no. 687

Insight 386SXL-25
Insight
1912 W. Fourth St.
Tempe, AZ 85281
800/755-9628,
602/350-1176
Reader service no. 688

Kris Master 386SXL-25
Kris Technologies
260 E. Grand Ave.
South San Francisco, CA
94080-4807
800/282-5747,
415/875-6729
Reader service no. 689

Leading Edge N3/SL25 Color
Leading Edge Products, Inc.
117 Flanders Rd.
Westborough, MA 01581
800/874-3340,
508/836-4800
Reader service no. 690

Mitac 3027F
American Mitac Corp.
410 E. Plumeria Dr.
San Jose, CA 95134
800/648-2287,
408/432-1160,
408/432-8519
Reader service no. 691

NCR Safari 3170
NCR Corp.
1700 S. Patterson
Dayton, OH 45479
800/225-5627,
513/445-5000
Reader service no. 692

NEC UltraLite SL/25C
NEC Technologies, Inc.
1414 Massachusetts Ave.
Boxborough, MA 01719
800/388-8888,
508/264-8000
Reader service no. 693

PC&C Dynova Model SLic3000
PC&C Research Corp.
1100 Avenida Acaso
Camarillo, CA 93012
800/843-1239 (outside CA), 805/484-1685
Reader service no. 694

Samsung NoteMaster 386S/25
Samsung Electronics America
Information Systems Division
105 Challenger Rd.
Ridgefield Park, NJ
07660
201/229-4000
Reader service no. 695

SunRace HyperBook 2200SX/25
SunRace Technology (USA) Corp.
809 S. Lemon Ave.
Walnut, CA 91789
714/468-2955,
714/468-2961 (fax)
Reader service no. 696

Swan 386SX/25
Swan Technologies
3075 Research Dr.
State College, PA 16801
800/468-9044,
814/237-4450 (fax)
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Tandy 3830 SL
Tandy Corp.
Contact a local Radio Shack store or dealer
Reader service no. 698

Toshiba T3300SL
Toshiba America Information Systems, Inc.
9740 Irvine Blvd.
Irvine, CA 92713
800/334-3445,
714/583-3000
Reader service no. 699

Twinhead Slimnote 386SXL/25
Twinhead Corp.
1537 Centre Pointe Dr.
Milpitas, CA 95035
800/545-8946,
408/945-0808
Reader service no. 700

USA Flex FlexNote 386SXL
USA Flex
471 Brighton Dr.
Bloomingdale, IL 60108
800/949-3539,
708/351-7204 (fax)
Reader service no. 701

ZDS Z-Note 325L Model 85
Zenith Data Systems
2150 E. Lake Cook Rd.
Buffalo Grove, IL 60089
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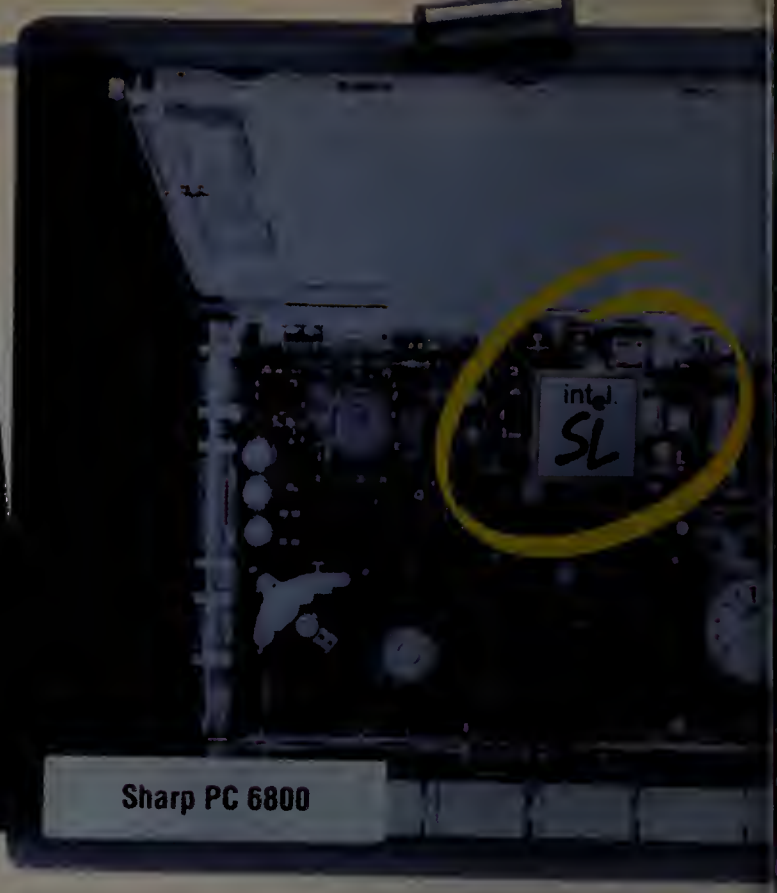
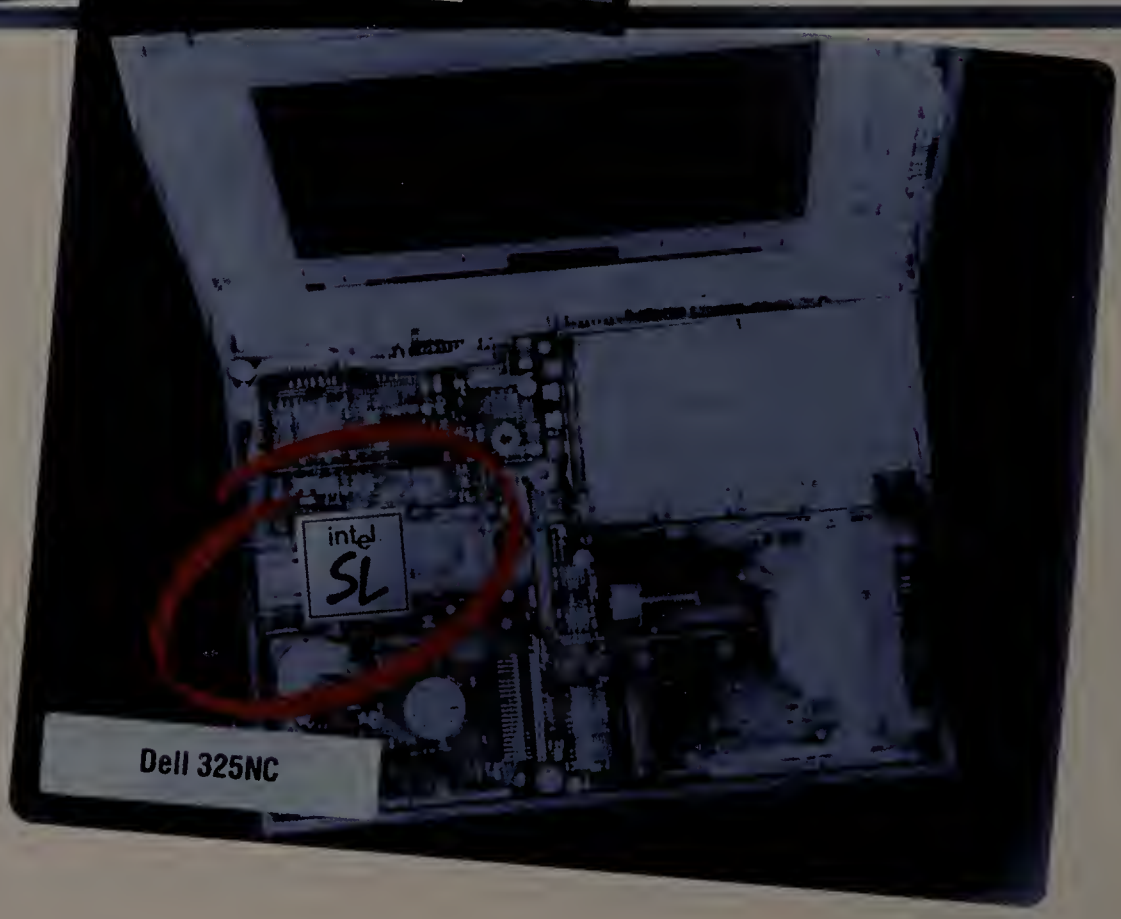
Circle 48 on reader service card

Toshiba T3300SL



Sharp PC 6800



Dell 325NC

Look what's at the heart

Take a closer look at some of the best notebook computers and it's easy to see why the prognosis is so good—they each have an Intel SL microprocessor. The Intel SL gives each of these unique notebooks a leg up, because it was designed specifically for the stop-and-go world of mobile computing.

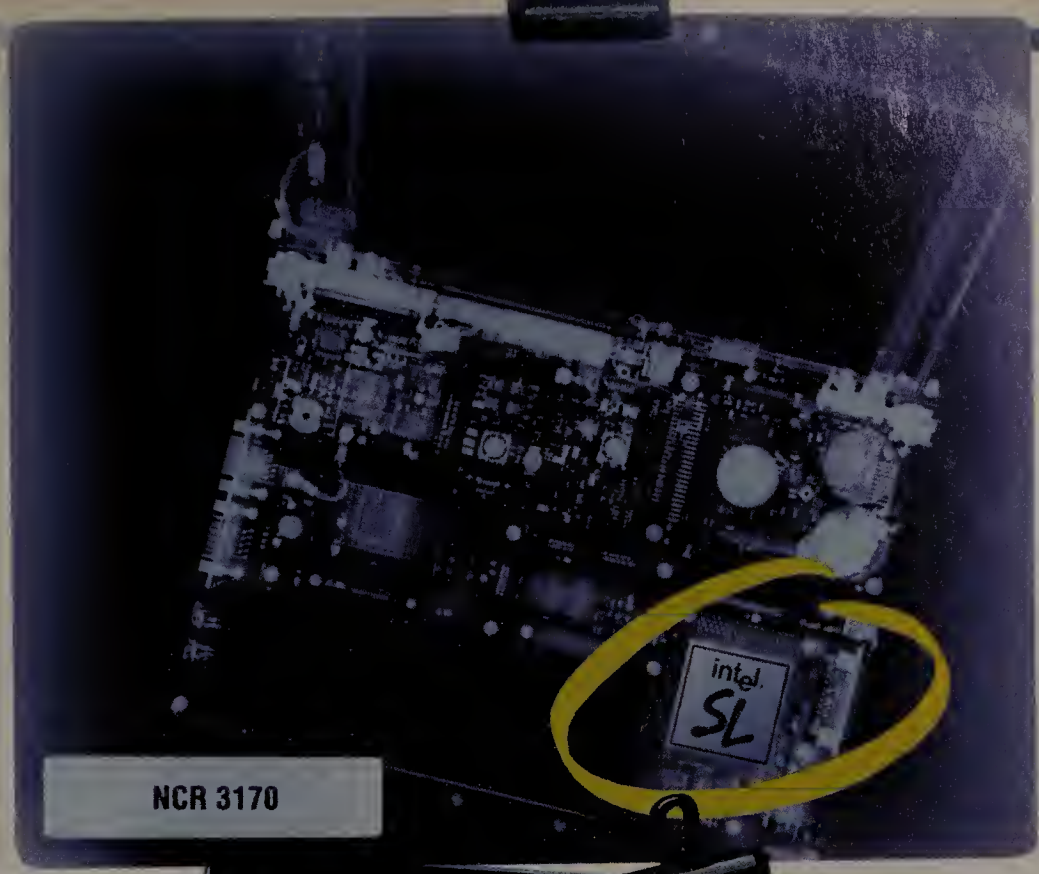
For example, the Intel SL has an instant on/off feature that eliminates long boot-up and shut-down sequences. If you're interrupted, the Intel SL holds your place and puts your entire system into suspended animation, using virtually no

Stop-and-Go Battery Life*

Average 386 SX
4.8 hours

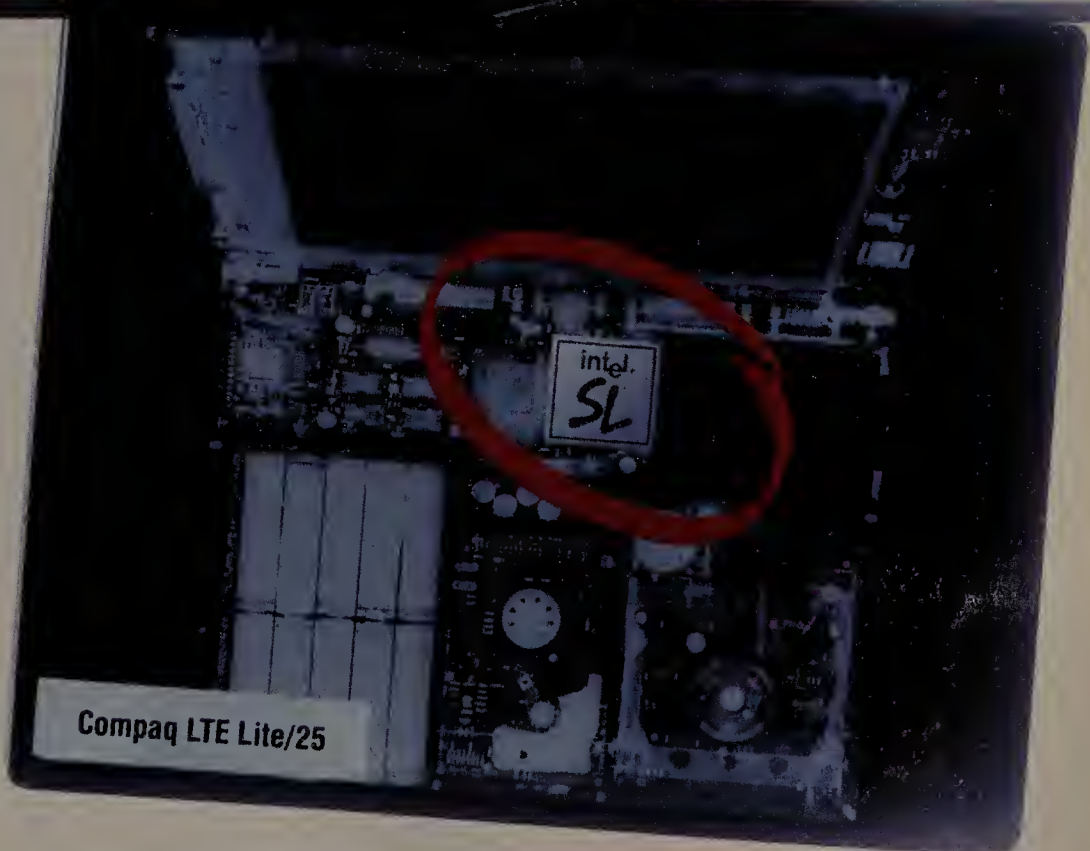
Intel SL
8.3 hours

©1992 Intel Corporation. The Intel Inside logo, Intel386 and the SL logo are trademarks of Intel Corporation. Intel SL microprocessors in this ad are larger than actual size. *PC World Report, February 1992. Based on user profiles with power management features enabled.



NCR 3170

Zenith Data Systems
Z-NOTE 325Lc



Compaq LTE Lite/25

# of all the best notebooks.

power and significantly extending precious battery life.

The Intel SL is a more highly-integrated microprocessor, which means lighter, more feature-rich notebooks that come in speeds up to 25 MHz. No wonder major manufacturers are prescribing the Intel386™ SL microprocessor as a cure for traveling hassles.

Call 1-800-228-4549 to receive more information and a complete list of Intel SL-based notebooks.

Then watch for notebooks with the Intel SL. Because nothing else is worth looking into.

intel®
The Computer Inside.™

Circle 115 on reader service card

HEY... DID YOU EVER GET MY MEMO?

WordPerfect® answers the most-asked question about electronic mail.

Click on "Send" in many of today's e-mail packages, and the urgent message on your screen will disappear, perhaps never to be heard of again.

You'll have no way of learning if it was ever delivered, or opened. You'll have no way of checking what you sent to whom, or when. And if you ever need to retract a message for corrections, well, *no way*.

So it's no wonder that in surveys of the features users would most like to see incorporated into their e-mail packages, message tracking ranks at or near the top. Except, that is, in surveys of WordPerfect® Office users.

An In Box Is Not Enough

In addition to the In Box that every e-mail package offers, WordPerfect Office gives you an electronic Out Box. So in addition to all the usual things you'll be able to do with your incoming mail (including read, reply, forward, save and print), we give you unusual control over your *outgoing* messages as well (including the ability to reread, rethink, rewrite and retract).

And the Out Box is just one of the features that separates WordPerfect Office from the rest of the e-mail pack.

E-Mail Everyone Can Agree On

If people would simply agree on a single computer platform, hooking everyone up with an e-mail system would be no trick. But since *that* shows no signs of happening, WordPerfect Office is available for all of the most popular platforms, including DOS, Windows, Mac, UNIX, VAX and Data General.

With WordPerfect Connections (included in Office 3.1), a DOS and Windows LAN can connect seamlessly (and transparently) with VAX and UNIX LANs, for example. So a message that goes out in Windows can arrive in UNIX and lose nothing in the translation.

Getting Your Message Out

Far-flung empires will find WordPerfect Office equally accommodating, with gateways to messaging systems that include Novell MHS, IBM OfficeVision, DEC, X.400, SMTP, MCI Mail and AT&T EasyLink, among others.

And unlike e-mail packages that simply deliver the mail, WordPerfect Office includes powerful Calendar and Scheduling functions that provide entirely new ways for your people to work together productively.

Let Us Show You How It Works

With WordPerfect Office, the possibilities are nearly limitless. And the technical support for users and administrators is widely acknowledged to be the best in the business. To learn more, contact your WordPerfect Representative, or for a free video demonstration, call (800) 526-5068.

(Until you have a more effective means of business communication up and running, the telephone will have to do.)

WordPerfect®

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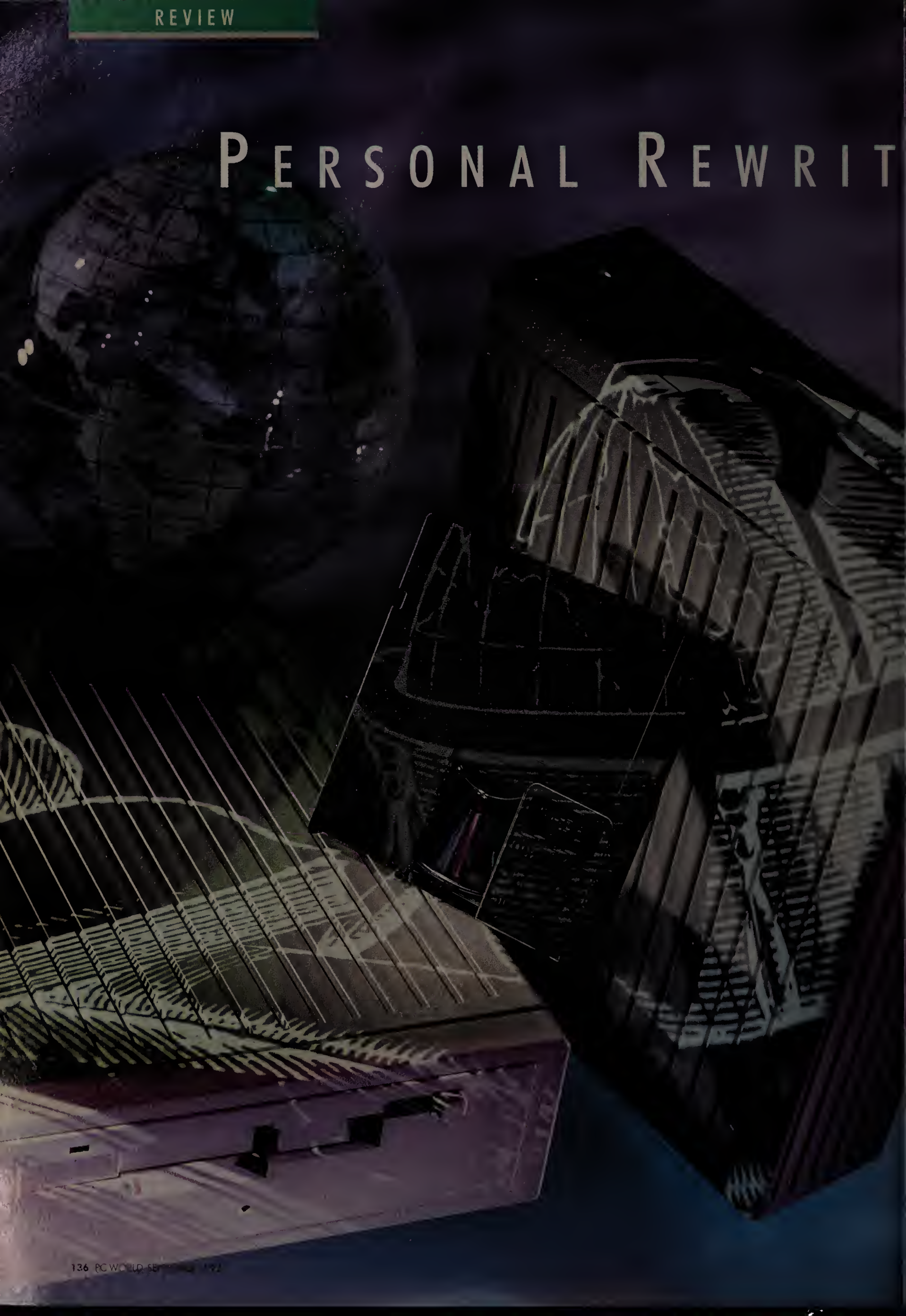


ABLE OPTICAL DRIVES

A WORLD OF UNLIMITED STORAGE

DISCOVER UNLIMITED, RELIABLE STORAGE ON 3½-INCH REWRITABLE DISKS WITH THESE 12 LOW-COST MAGNETO-OPTICAL DRIVES.

BY JOHN WALKENBACH

Demand for disk space has gotten out of hand. Cramped by limited hard disks, we frequently clean house, deleting old files or archiving them on floppy or tape. Those who use graphical applications—particularly for presentations or desktop publishing documents—have to shuffle huge files. For example, the two high-resolution, continuous-tone pages in front of you took over 50MB of disk space! Try copying that onto floppies.

You might not create files that big, but if you ever have to archive, transport, or back up multimegabyte files, consider the hottest new medium in mass storage: the rewritable magneto-optical (MO) drive. The new MO drives pack up to 122MB (128MB unformatted) on each removable 3½-inch disk. Their extended capacity is limited only by the number of disks you buy. A 3½-inch MO disk looks like a 3½-inch floppy but is twice as thick. And the metal protector hides the rainbow sheen of optical media.

You wouldn't use an MO drive to replace your hard disk; its speed is roughly half that of a hard drive's. But if you need to save successive versions of large documents, handle enormous data bases, or plan to work with sound or video (both capabilities are built into *Windows 3.1*), MO drives make real sense.

As the name implies, magneto-optical drives perform their magic using both magnetic and optical technology. Unlike a magnetic drive, however, the read/write head on an MO drive never flies close to the media, thereby eliminating the possibility of head crashes. And you can expect your disks to last: Vendors say their media will withstand more than 1 million write cycles without deterioration.

For the first time, rewritable optical drives are truly cost effective. This review covers a dozen, with street prices ranging from $1641 to $2473 and media costs running about $60 a disk. The drives are available as external units or internal models. MO drives generally hook to your system via a SCSI interface, and you can daisy-chain units together.

Once you install your MO drive, it looks and feels like a normal DOS disk, and replacing the cartridge is no more complicated than slipping in a new 3½-inch floppy. Initializing and formatting takes an average of

PHOTOGRAPHS BY HENRIK KAM

15 minutes—not bad for 128MB media. And all the DOS commands (except DISKCOPY and DISCOMP) work as expected. You can even use on-the-fly data compression products such as Stac's *Stacker* or Addstor's *SuperStor* to increase storage capacity to over 200MB.

Twelve Guys Named MO

We tested the dozen drives in this review by using them to perform a variety of real-life tasks, including transferring data files, running multimedia, resetting file attributes, deleting files, and performing several data base operations. Except for the IBM unit, which has a slower disk rotation speed than the others, all the drives performed acceptably, averaging about half the speed of a fast IDE hard disk.

When our last file was transferred and the final score tallied, we came up with three Best Buys. The Liberty Systems 115MO features very good performance, a terrific price, and unsurpassed portability—it's your top choice if you want to use your drive with a laptop or move it from PC to PC. The OCEAN Microsystems Vista 128 was the top overall performer, while the Pinnacle Micro REO-130S came in first on our service-and-support tests. If you find yourself up against the wall with a continually overloaded disk, we recommend any of these three personal rewritable drives as your ticket to limitless storage.

John Walkenbach is a contributing editor for PC World. *He can be reached on PC World Online.*

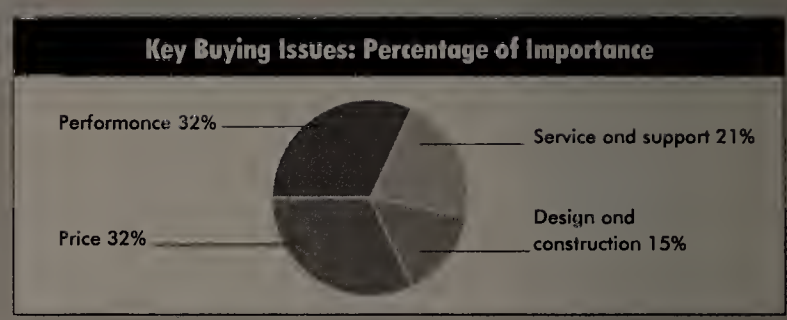
For more information on all products in this article, circle reader service no. 902.

EXECUTIVE SUMMARY

Liberty, OCEAN, Pinnacle Deliver Just a Bit MO

MO becomes cost effective with the new breed of 3½-inch 128MB drives.

If you have the application—desktop publishing, complex presentations, multimedia development, or random-access backup—3½-inch magneto-optical drives have the best value in large-capacity removable media. The **Liberty, OCEAN,** and **Pinnacle** drives are all Best Buys with excellent design. **OCEAN** gives you top speed, **Liberty** easy portability and a great price, and **Pinnacle** the best service and support in the roundup.



Excellent ★★★★
Good ★★★
Fair ★★
Poor ★

	Reader service number	Performance	Price	Service and support	Design and construction	Overall value
IBM Model MD3125B	n/a	½	☆☆☆☆	☆☆☆	☆☆☆	★★½
Laura Tech OptiPort TNT-3002I	641	☆☆☆☆	☆☆☆	☆☆☆½	☆☆☆½	★★★½
Liberty Systems 115MO	642	★★★½	★★★★	★★★½	★★★★	★★★★
OCEAN Microsystems Vista 128	643	★★★★	★★★½	★★★½	★★★★	★★★★
Optical Laser Panasonic LF-3000	644	☆☆☆½	☆☆☆	☆☆☆½	☆☆☆☆	★★★½
Optical Laser Ricoh 3000	644	☆☆½	☆☆☆	☆☆☆½	☆☆☆☆	★★★
Panasonic LF-3000	645	☆☆☆	☆☆☆	☆	☆☆☆☆	★★★
Pinnacle Micro REO-130S	646	★★★½	★★★½	★★★★	★★★★	★★★★
PLI Infinity Optical 3.5"	647	☆☆☆½	☆☆☆☆	☆☆☆½	☆☆☆	★★★½
Procom Technology MEOD128	648	☆☆	☆☆☆½	☆☆☆☆	☆☆☆½	★★★
Sony RMO-S350	649	☆☆☆½	☆☆	☆☆☆	☆☆☆☆	★★★
XYXIS XY128RW	650	☆☆☆½	☆☆½	☆☆☆½	☆☆☆½	★★★

Overall value is calculated by multiplying each category rating by its weight percentage, summing the results, and rounding to the nearest half number.

IBM Model MD3125B

PROS: Least expensive drive in roundup, O-ROM compatible, lock and key system for drive security **CONS:** Slowest drive tested, can't create multiple partitions, not bootable, no drive door, no central support

IBM was first with this size and capacity of drive, but the IBM Model MD3125B performed dead last on every speed test except the motion-video multimedia benchmark, where it was second worst. It includes a Micro Channel SCSI adapter, but we tested it with the 8-bit Corel LS-2000 SCSI adapter that IBM recommends for non-MCA systems. To its credit, the Model MD3125B reads currently available O-ROM disks, and its $1641 estimated street price is the best we found. Its case has a lock and key mechanism that lets you lock down the drive.

This is the one drive we tested that can't partition a disk or create bootable disks. The manual covers MCA but not AT-bus installations. Furthermore, there's no drive door for dust protection. Support is through dealers only. If you need O-ROM compatibility and the cheapest price, the IBM's worth a look. Otherwise, its sluggish performance puts it out of the running in this roundup.

Laura Technologies OptiPort TNT-3002I

PROS: Top data throughput
CONS: Fourth slowest data base seek times

The OptiPort TNT-3002I teams a Ricoh drive mechanism with a TenTime TNT-4050 SCSI adapter. (An external version wasn't available in time for review, so we tested the internal.) The OptiPort produced terrific throughput, finishing second overall in our speed tests, first in the 110MB data transfer test, and in a virtual tie for first in the motion-video sequence. Its seek tests weren't as impressive, however, winding up fourth from last. If you really want a performance boost, for an extra $900 Laura Technologies will sell you a muscular TenTime PowerCache 512K SCSI caching controller, which is expandable to an impressive 16MB.

Service and support rate well, but you have to pay the toll for tech support calls, and you get no service turnaround policy. At $2207, the price is good but not great. If you want a fast drive for multimedia or graphics applications, however, the OptiPort TNT-3002I is a fine value.

Liberty Systems 115MO

PROS: Excellent price, built-in parallel-to-SCSI interface for portable operation, excellent design **CONS:** Sparse documentation, unit must be opened to change SCSI termination, horizontal mount only

The Liberty Systems 115MO is ideal for notebooks: Its built-in Trantor T-338 interface lets you plug into the parallel port on any PC and use it wherever there's an AC outlet. Using the bypass connector and a 16-bit Rancho Technology SCSI adapter, we got a 20 percent speed boost and a tie for second on the 30MB file copy test. The drive uses a MOST RMD-5100S drive mechanism housed in a handsome black case.

Service and support are very good with a 2-day turnaround policy, although calls are on your dime. On the downside, this is the only drive that uses internal SCSI termination (you have to contact Liberty Systems if you need to change it). But the $1807 direct price is the third best here, and you can save $100 if you don't want the T-338 adapter and $249 if you forgo the faster SCSI adapter. If you want limitless storage wherever you go, the Liberty Systems 115MO is your Best Buy.

OCEAN Microsystems Vista 128

PROS: Fastest drive tested, excellent design, good documentation **CONS:** No power-on indicator

If you must have the fastest, buy OCEAN Microsystems' Vista 128. With its 16-bit Future Domain TMC-1650 SCSI host adapter, it placed no lower than second or better on every test, including first on the change attributes and data base tests and a virtual tie for first on our motion-video sequence. Built around the MOST drive mechanism, here's one drive that maintains both fast access times *and* transfer rates.

Service is fine, with toll-free tech support and a 2-day service turnaround. Our complaints are minor: There's no power-on indicator, and the SCSI cable is too short. The drive includes a set of snap-on legs and an adaptable nameplate if you want to use its space-saving vertical mount. The $2095 direct price is attractive, and if you want the fastest performer here, the Best Buy OCEAN is the drive for you.

Optical Laser Panasonic LF-3000

★ ★ ★ ½

PROS: Very good overall performance and design, on-site service option **CONS:** Manual installation, confusing documentation, large default cluster size potentially reduces capacity

Optical Laser matches the Panasonic LF-3000 with a 16-bit TenTime TNT-4000 SCSI host adapter. Quick overall speed included finishing in a five-way virtual tie for first on the motion-video test. But it came in second to last copying 110MB of files, suggesting that the interface may be a bottleneck.

The $2195 drive has extra dust protection for the motor and optical elements. Service is solid with a toll-free line, but confusing documentation doesn't help you with the manual setup. And the vendor chose a larger-than-usual 2048-byte default cluster size, which optimizes performance but can cut capacity for large numbers of files. This drive is a quick, well-supported performer and a solid value. In fact, if you like the Panasonic, you're better off buying from Optical Laser to get the company's superior support.

Buying Smart: MO Better Storage

MO drives are most attractive to desktop publishers, multimedia mavens, users who need fast, ultrahigh-security backups, and those who generate vast amounts of data. Desktop publishers generate huge data and graphics files and need fast access to large clip-art libraries. Magneto-optical drives also let you save successive versions of a job—a real lifesaver when your boss or client says, "Let's go with it the way you had it two weeks ago."

While CD ROM is shaping up to be the main medium for *distribution* of multimedia applications, an MO drive is a good choice for multimedia developers. For high-security backups, MO disks aren't magnetically erasable unless they're hot enough to cook on, and vendors rate media life up to 30 years.

PERFORMANCE

If you need Winchester speeds, you may be better off with an Iomega or SyDOS removable-media hard drive. Most MO drives are only about half as fast, although they're up to ten times faster than floppy or CD ROM drives.

You can also expect a 5 to 10 percent speedup by using a 16-bit rather than an 8-bit SCSI adapter.

Performance varied depending on the test, but OCEAN Microsystems' Vista 128 was the overall speed champ.

PRICE

MO drives are still fairly expensive, but if you use a lot of disks, their lower media cost gives them the edge over magnetic removable-media drives from SyDOS or Iomega. Street prices varied from $1641 to $2473. We priced each unit with interface card, cables, and software necessary to install and run it.

SERVICE AND SUPPORT

A minimum 12-month parts and labor warranty is standard fare—only Optical Laser has an on-site service option. We evaluated support by calling each vendor three times with standard technical questions. Pinnacle Micro and Procom tied for best service and support.

DESIGN AND CONSTRUCTION

There are only a handful of actual drive manufacturers: The IBM, Panasonic, and Sony drives all use their own mechanism. The other subsystems incorporate MOST, Ricoh, and Sony drives into their housings and provide an adapter and software. Because of the limited number of drive mechanisms, design tended to rate similarly. We had seven four-star designs.

MO drives are often available in both external and internal configurations, and if your PC has an open bay, you can save $200 to $400 and some desk space by choosing an internal. In most cases, we reviewed externals, because they're easier to install and move between test systems. By nature, all external drives are portable, but the Liberty Systems 115MO features (along with the standard SCSI interface) a built-in parallel-to-SCSI interface that lets you plug the drive into any PC's parallel port.

All the drives allow daisy-chaining, so you can operate up to seven drives from one host adapter, depending on design. The majority offer a spring-loaded door to keep dust out.

These drives all conform to the ISO physical format standard for 3½-inch optical media. Since the logical format varies, there's no guarantee that a disk written on one drive will be readable on a drive from another manufacturer.

Some vendors, such as Corel and Autodesk, are distributing software on read-only O-ROM disks. The capability to read O-ROM disks varies, although IBM drives read currently available O-ROM disks. Check with your software vendor to determine whether your drive can read their disks.

Our new tape drive has five times the features for one times the price.

The new Iomega® Tape250.

Introducing the next generation in tape backup. Iomega's new 250MB tape drive, the Tape250.

MICROSOFT WINDOWS COMPATIBLE

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Minicartridge Tape Drive Comparison

	Iomega Tape250	CMS Jumbo	Irwin AccuTrak
QIC 80 Read & Write	•	•	
QIC 40 Read	•	•	
Irwin 80 & 40 Read	•		•
Windows 3.1 & DOS software	•		
Fits standard 1" bay	•		
QIC 80 entry price	$299	$350	$349

The safe choice.

You can feel confident trusting your data to Iomega, the makers of Bernoulli.® We've been making quality storage products for over ten years, winning more awards than any other fixed or removable drive manufacturer. Earning a 99 percent customer satisfaction rate. And we're the only computer company to win the Shingo Prize for excellence in American manufacturing.

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There's much more you should know about Iomega's new Tape250, like specific pricing and configurations. So call today for a free brochure. You'll be five times as glad you did.

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†Phone number for U.S. and Canada. Internationally, call 49-761-450-40. For customer service questions, call 1-800-456-5522.

Circle 152 on reader service card

FEATURES EVALUATION

Magneto-Optical Drives: A Dollars and Cents Decision

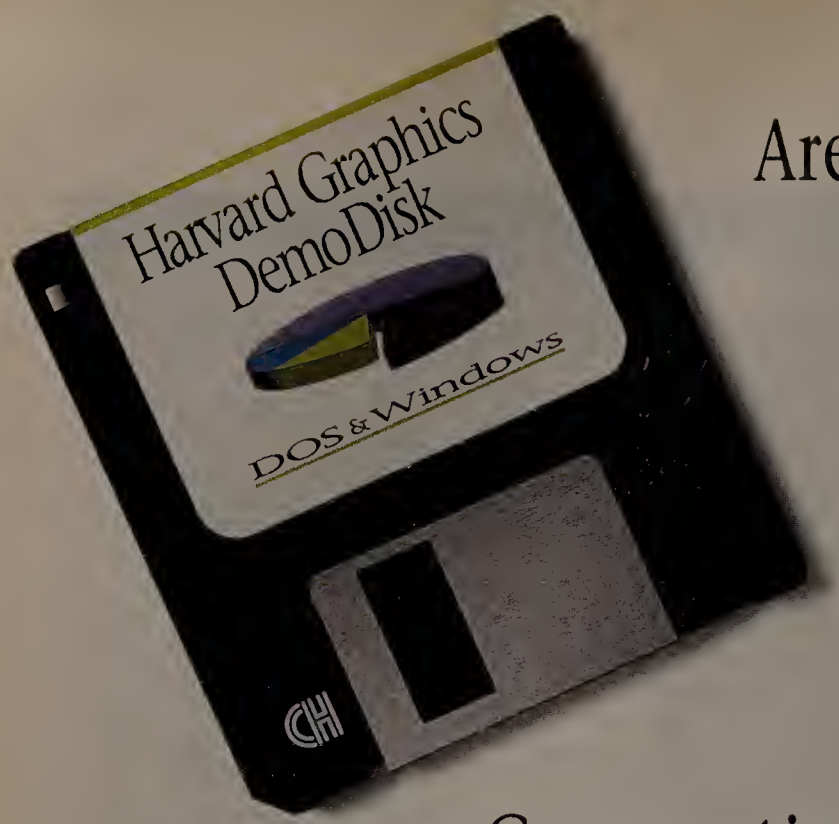
Once you've decided it's worth paying for the convenience of magneto-optical storage, you'll find relatively slight design variations from drive to drive. That's one reason price figured heavily in our selection of the three Best Buys.

● Yes
○ No
n/a = not applicable

	IBM Model MD3125B	Laura Technologies OptiPort TNT-3002I	Liberty Systems 115MO	OCEAN Microsystems Vista 128	Optical Laser Panasonic LF-3000
Standard features					
Street price 5/22/92	$1641	$2207	$1807	$2095	$2195
List price 5/22/92	$1865	$2250	$1807	$2095	$2195
Interface	IBM Micro Channel SCSI	16-bit SCSI TNT-4050	T-338 parallel-to-SCSI and Rancho RT10-AT	16-bit SCSI Future Domain TMC-1650	16-bit SCSI TNT-4000
Manufacturer's specifications					
Average seek time (ms)	66	45	35	35.2	40
Average latency time (ms)	16.7	10	12.5	12.5	10
Average access time (ms)	82.7	55	47.7	47.7	50
Mean time between failures (hours)	30,000	30,000	30,000	30,000	25,000
Includes a cartridge	●[1]	●	●[1]		●
Design and construction					
Unit tested	external	internal	external	external	external
Other configuration available	internal	external	none	internal	internal
Drive mechanism	IBM	Ricoh	MOST	MOST	Panasonic
Power supply	internal	internal	internal	internal	internal
RAM cache (buffer)	64K	128K	64K	128K	128K
Capacity with DOS format	121MB	115MB	121MB	121MB	121MB
Partition disk with boot sector	○	●	●	●	●
Disk rotation speed (RPM)	1800	3000	2400	2400	3000
Height by width by depth (inches)	3.3 x 10 x 10.5	1.6 x 4 x 5.8	2 x 7 x 9.5	2.1 x 9.8 x 10.4	6.1 x 3.8 x 10
Footprint (square inches)	105	23	66.5	101.4	38
Mount	horizontal or vertical	horizontal or vertical	horizontal	horizontal or vertical	horizontal or vertical
Power-on indicator	●	○[2]	●	●	●
In-use indicator	●	●	●	●	●
Emergency eject	●	●	●	●	●
Compatibility					
Works with Macintosh	○	●	●	●	●
Micro Channel bus interface available	●[3]	●	n/a	●	●
Service and support					
Warranty (months)	12	12	12	12	12
Central tech support number/toll free	○/○	●/○	●	●	●/●
Daily support (hours)	n/a[4]	8.5	9	8[5]	9[5]
Weekend support	n/a[4]	○	●	●	○
Unlimited free support	n/a[4]	●	●	●	●
BBS/fax	n/a[4]	●/●	●/●	●/●	○/●
Turnaround policy (days)	n/a[4]	none	2	2	3
			BEST BUY	BEST BUY	

[1] Includes two cartridges.
[2] Internal version.
[3] Comes standard.
[4] Support is through dealers only.
[5] On-site service available.

	Optical Laser Ricoh 3000	Panasonic LF-3000	Pinnacle Micro REO-1305	PLI Infinity Optical 3.5"	Procom Technology MEOD128	Sony RMO-S350	XYXIS Corp. XY128RW
	$2250	$2164	$1990	$1770	$2063	$2473	$2345
	$2250	$2459	$2394	$2099	$2344	$2810	$2665
	16-bit SCSI TNT-4000	B-bit SCSI Carel LS-2000	16-bit SCSI Future Domain TMC-1660	16-bit SCSI PLI PC QuickSCSI	16-bit SCSI Pracam CC-16	16-bit SCSI Sany	16-bit SCSI Adaptec 1522
	40	40	40	40	40	40	42
	10	10	10	10	10	10	10
	50	50	50	50	50	50	52
	25,000	25,000	25,000	25,000	25,000	40,000	30,000
	●	●	●	●	●[1]	●	●[1]
	external	external	external	external	external	external	external
	internal	internal	internal	none	none	none	internal
	Ricoh	Panasonic	Sony	Sany	Sany	Sany	Ricoh
	internal	internal	internal	internal	internal	internal	internal
	128K	128K	64K	64K	64K	64K	128K
	121MB	121MB	121MB	121MB	121MB	121MB	121MB
	●	●	●	●	●	●	●
	3000	3000	3000	3000	3000	3000	3000
	3.7 x 6.1 x 10	6.1 x 3.B x 10	2.2 x 8.4 x 6.8	2.4 x 9.B x 9.8	2.3 x 9.5 x 10.5	3 x 10 x 11.3	2.5 x 6 x 9
	61	38	57	96	99.B	113	54
	horizontal or vertical	vertical	horizontal or vertical	horizontal or vertical	horizontal or vertical	horizontal or vertical	horizontal
	●	●	●	○	○	●	●
	●	●	●	●	●	●	●
	●	●	●	●	●	●	●
	●	●	●	●	●	●	●
	●	●	●	●	○	●	●
	12	12	12	12	12	12	12
	●/●	●/●	●/●	●/●	●/●	●/○	●/○
	9[5]	8	9	9	9	9	9
	○	○	●	○	○	○	○
	●	●	●	●	●	●	●
	○/●	●/○	●/●	●/●	●/●	○/○	○/●
	3	none	2	2	2	2	none
			BEST BUY				



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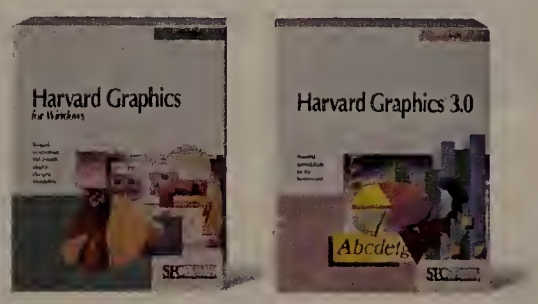

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Circle 204 on reader service card

Optical Laser Ricoh 3000

PROS: Excellent design, on-site service option **CONS:** Third-slowest overall performance, manual installation, confusing documentation, large default cluster size potentially reduces capacity

Optical Laser's second offering also uses the 16-bit TenTime TNT-4000 SCSI adapter, but this time pairs it with a Ricoh 3000 drive. You pay $2250—$55 more—and get slower performance. Although it joined the five-way virtual tie for first on the motion-video sequence, it scored second to last on the data base test and third slowest on overall performance.

The design is excellent: As with the Panasonic, there's a vertical mount and a dust filter to protect the motor and optical elements. As with the Optical Laser Panasonic LF-3000, you get the same difficult installation procedure and large default cluster size. The service-and-support packages on the two products are identical and generally very good, however. A mere $100 will buy you a year of on-site service, something no one else here offers. Although this drive rates as a good value, the Panasonic, because of its faster performance, is the better choice of the Optical Laser drives.

Panasonic LF-3000

PROS: Excellent design **CONS:** Poor support responsiveness, no service turnaround policy, 8-bit interface slowed speed

The $2164 Panasonic LF-3000 is identical to Optical Laser's LF-3000. Panasonic recommended we use an 8-bit Corel LS-2000 SCSI card, however, which cut into its overall performance scores. Although it was the fastest of all to delete 3000 files, and it beat the Optical Laser Panasonic on the 110MB data transfer benchmark, this drive trailed the Optical Laser version (with its 16-bit adapter) on every other test. Otherwise, the two drives are identical.

The Panasonic service-and-support package looks fine on paper: You get a toll-free tech support line and unlimited free support. But there's no service turnaround policy, and only one of our technical support calls was returned. This is a well-designed drive, and if you pair it with a compatible 16-bit adapter it will perform well. But it's hard to recommend a poorly supported product.

Pinnacle Micro REO-130S

PROS: Excellent performance, priced under $2000, excellent documentation, excellent design **CONS:** Cable too short, loud fan

Easy installation, fine performance, an attractive $1990 street price, superb documentation, toll-free support—the Pinnacle Micro REO-130S has it all. The unit incorporates a Sony drive into a box that works either horizontally or vertically. The Pinnacle comes with a 16-bit Future Domain TMC-1660 SCSI host adapter, and the REO-130S finished among the quickest drives here. It placed third overall and second on the data base test, and tied for second on the 110MB data transfer test.

The documentation is a model for others to follow, with everything in one binder and illustrations that match the hardware. On top of that, the service and support package ties with Procom's for the best here. What's left to kick about? Well, the cable that comes with the drive is on the short side. And if you're sensitive to noise, you may find the fan a bit loud. Looking at the overall picture, however, the Pinnacle wins a Best Buy with ease and has the best overall balance of features.

PLI Infinity Optical 3.5"

PROS: Fast throughput on large files, excellent price **CONS:** Incomplete documentation, short cable, loud fan, no power-on light

Like the Best Buy Pinnacle Micro REO-130S, the PLI Infinity Optical is based on the Sony SMO-P301 drive. For $220 less, PLI packages it with its own 16-bit PC QuickSCSI host adapter, and its excellent $1770 street price was second cheapest of all the drives in the review. The PLI drive gave the Pinnacle a close run—it was a bit slower on all tests except copying a 30MB single file, where it was the best of all.

What does PLI leave out? Amenities that many buyers can live without, such as a power-on indicator, automatic installation, and a manual for the drive itself. However, you do get easy access to its software through a menu. As with the Pinnacle, the cable is too short and the fan somewhat loud. PLI's service policies include a toll-free tech line and a 30-day money-back guarantee. If you want MO on a budget and don't mind forsaking convenience, the PLI is your best bet.

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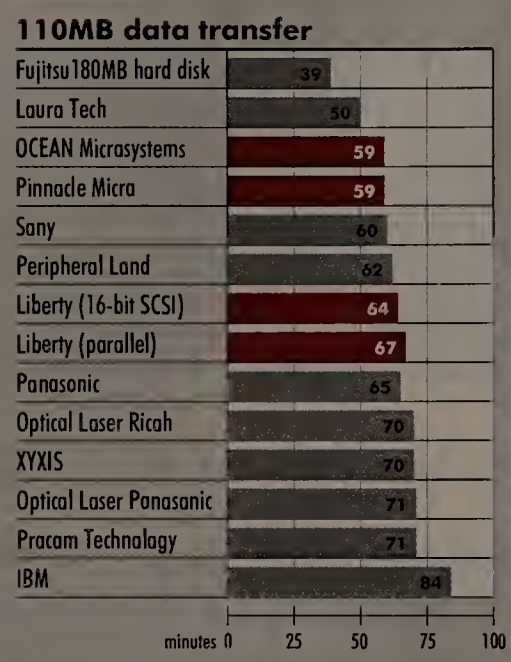
Circle 208 on reader service card

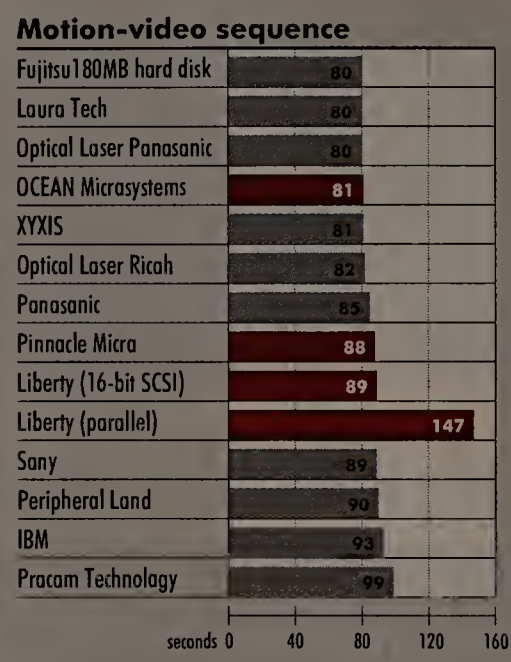
PC WORLD TEST REPORT

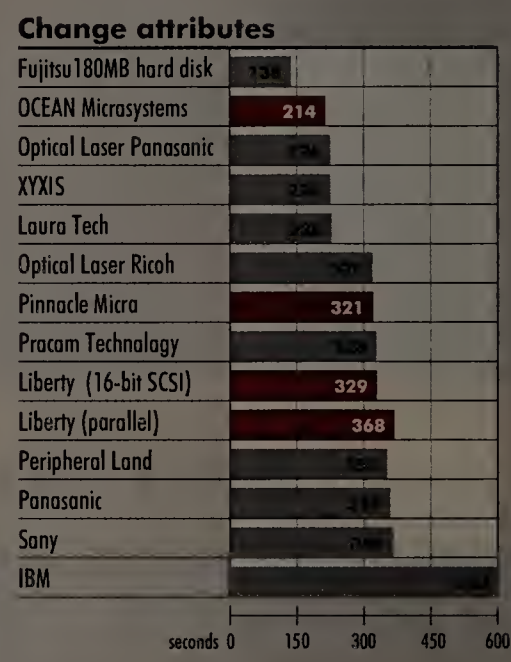
OCEAN Rules the Roost

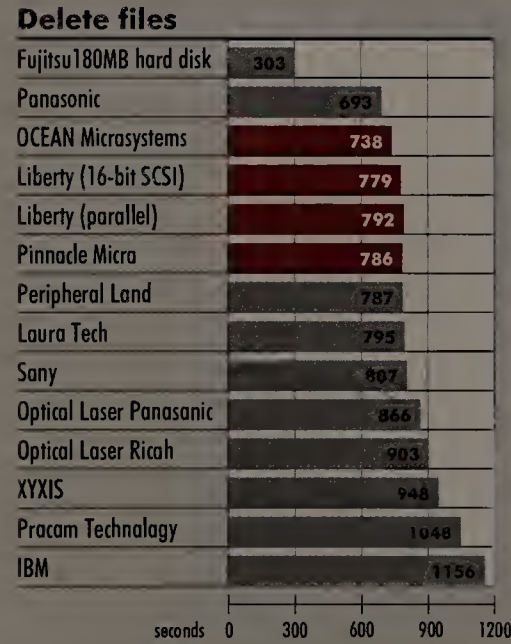
The OCEAN Microsystems Vista 128 was the overall performance winner, offering both fast access and high throughput. Laura Technology's OptiPort TNT-3002I came in close behind.

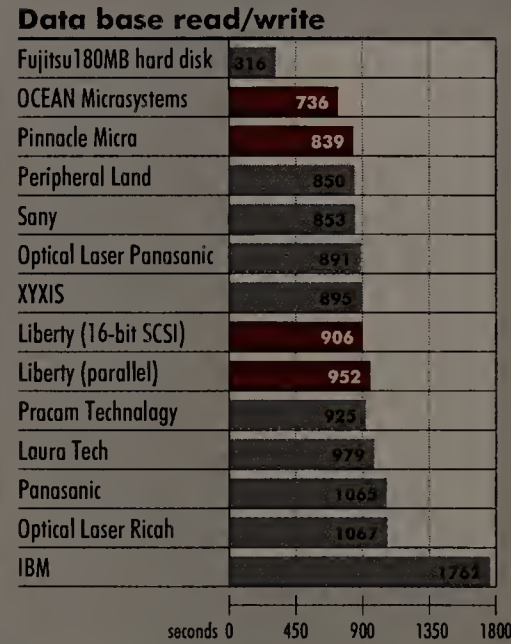
BEST BUY

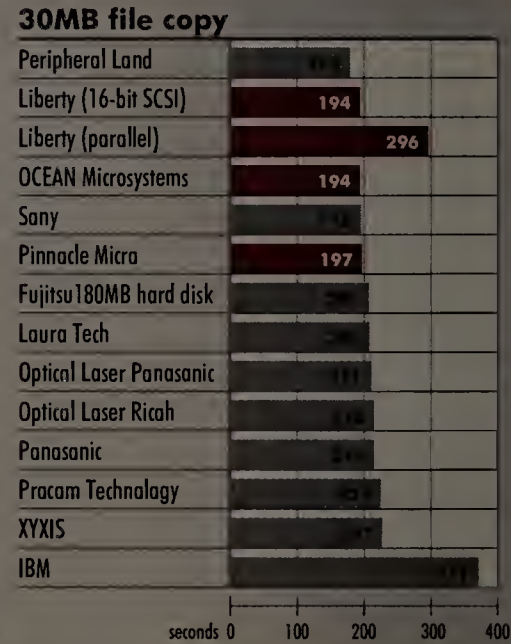












Methodology
We tested each 3½-inch magneta-optical drive with its interface and software device drivers configured according to the manufacturer's recommended settings. We priced and tested the Liberty 115MO with both the built-in Trantor T-338 parallel-to-SCSI interface and (using the built-in bypass) a 16-bit Rancho Technology RT10-AT SCSI. Since every other drive was tested with a standard SCSI adapter, we used the faster Rancho adapter times in our ratings. The test system consists of a 50-MHz 486DX PC with 8MB RAM, a 17ms 180MB Fujitsu IDE hard drive (we included the benchmark times on this drive for reference purposes), a Hitachi CDR-3600 internal CD ROM drive connected via non-SCSI interface, and an ATI VGA Wonder card installed in an 8-bit slot to avoid potential conflicts with SCSI controller cards. In addition, the motherboard's 64K external caching and video shadow RAM were disabled.

110MB data transfer
We copy 110,316,152 bytes of data contained in 3027 files from the CD ROM drive to the MO drive. This also involves creating several subdirectories at multiple nested levels on the rewritable disk. The source CD ROM disk is National Geographic's *Mammals*. We measure the total time to complete the transfer. The two Optical Laser products couldn't hold the entire 110MB of files because of a 2048-byte default cluster size. We copied the last 10MB separately and added the times.

Motion-video sequence
We execute the files necessary to display a full-motion video image and record the time required to display the full sequence. All the products displayed a smooth video sequence except the Liberty 115MO with the parallel interface, which produced a choppy sequence.

Change attributes
We use *XTREE Gold* to tag all 3027 files on the rewritable disk and remove the read-only, archive, hidden, and system file attributes. We record only the time for the attribute change.

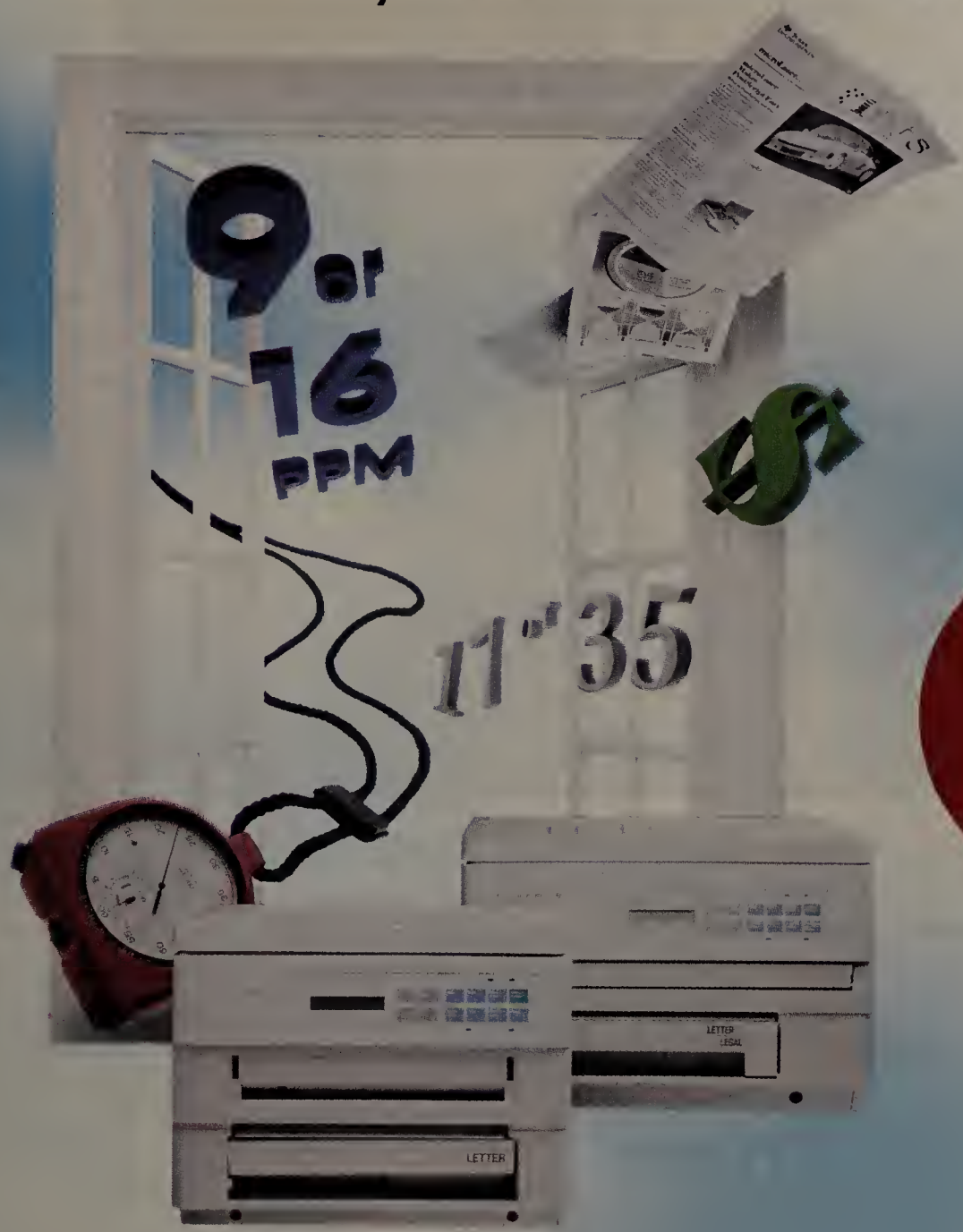
Delete files
We use *XTREE Gold* to tag all 3027 files and delete them from the rewritable disk. We record only the time for the deletion.

Data base read/write
We use a suite of tests that create two 2MB data base files and perform sequential and random reads and writes to these files in two stages. The first stage uses a file with 4096 records of 512 bytes; the second stage uses a file with 4096 records of 4096 bytes each. We record the elapsed time for each test and added them together for a total score.

30MB file copy
We copy a single 30MB file from the internal IDE hard drive to the rewritable disk.

Data based on tests designed and conducted by Product Performance Laboratories of Brick, New Jersey, in cooperation with the PC World Test Center. All rights reserved.

Four reasons to buy a TI microLaser™ printer.



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Take our personal microLaser Plus for example. With its high duty cycle of 10,000 pages-per-month* and a standard one-year limited warranty**, you can rely on your microLaser to work the first time, every time, for years.

4. Value Starting as low as $999†, there's a microLaser designed to fit any budget. From the single user all the way up to a network. Consider this, too: microLaser's average cost per page is only 1.9 cents‡, while some laser printers average around 3.3 cents. The microLaser not only makes sense, it saves you money, too.

For details on the right microLaser for you and the name of the nearest dealer, call

1-800-527-3500.

The microLaser PS17 has earned the 1990 *PC World* Best Buy award; microLaser PS35 has earned the 1990 *InfoWorld* Excellent Value award and 4½ mice from *MacUser*, October 1990.

Features	microLaser Plus Basic	microLaser Plus PS17/PS35	microLaser Turbo	microLaser XL Turbo
PPM	9 ppm	9 ppm	9 ppm	16 ppm
Emulation	HP LaserJet II	HPLJII/PostScript	HPLJII/PostScript II	HPLJII/PostScript II
Processor	68000	68000	RISC/8220	RISC/8220
Fonts	14 HP Fonts	17 or 35 Scalable	35 Scalable	35 Scalable
List Price	$999	$1,399/$1,499	$1,749	$3,649

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*Based on estimated typical usage. **For more information on service upgrade options, call 1-800-847-5757 in the U.S. and 1-800-268-6314 in Canada. †Suggested retail price – dealer prices may vary. ‡Based on suggested retail price of consumables and approximate page coverage rating for each consumable at 4% black (toner, developer and OPC). microLaser is a trademark of Texas Instruments Incorporated. Microsoft and DOS are registered trademarks, and Windows is a trademark of Microsoft Corporation. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions. LaserJet is a registered trademark of Hewlett-Packard, Inc. Apple and Macintosh are registered trademarks of Apple Computer, Inc. OS/2 is a registered trademark of International Business Machines Corporation. UNIX is a registered trademark of AT&T. ©1992 TI 76543

Circle 296 on reader service card

Procom Technology MEOD128

PROS: Excellent service and support
CONS: Second slowest overall, confusing documentation, no power-on indicator

Like the Pinnacle and PLI subsystems, the $2063 Procom MEOD128 uses a Sony drive mechanism. It's paired with the company's own CC-16 Enable SCSI host adapter, a full-length card requiring an unobstructed slot. The drive/adapter combo sets no speed records: The MEOD128 was second to last in overall performance. The Procom bottomed out on the motion-video sequence, taking about 25 percent more time than the winners to run it, though the sequence was still smooth.

Procom's documentation is too much: You get seven manuals, including some for Mac users only, which makes it hard to figure out where to begin. Once you get your hands on the right stuff, however, installing the drive is eased by the top-notch installation software. What's more, you can convert the drive to a space-saving vertical configuration by just popping on the extra set of rubber feet. Procom support is a saving grace with a toll-free line and a 2-day turnaround policy. This subsystem's poor performance, however, should steer you elsewhere.

Sony RMO-S350

PROS: Excellent design with added dust protection **CONS:** Expensive, tech support could be better

The drive mechanism on the Sony RMO-S350 closely matches the Best Buy Pinnacle's. You might think you could do better going directly to the manufacturer, but that's not the case. The Sony is expensive: Its $2473 estimated street price is over $100 more than any other drive here. And although it comes with a proprietary 16-bit adapter, the RMO-S350 fell a notch lower than the Pinnacle on the performance chart and came in next to last on the change attributes test.

The Sony is sturdy, large, and heavy; fortunately, you can operate it vertically to save space. The service-and-support package could use improvement: There's no toll-free tech support, and our questions were answered with variable accuracy. If you're working in a dusty area, you'll appreciate the dust filter. There's no question that Sony makes an excellent drive mechanism, but you're better off buying it from Pinnacle.

XYXIS XY128RW

PROS: Responsive tech support
CONS: Confusing and sketchy documentation, can't operate vertically

The XYXIS XY128RW had us scratching our heads as soon as we took it out of the box. To begin with, the manual told us to run an installation program that wasn't there. We found two other installation programs: The correct one depends on your SCSI adapter—a point not mentioned in the manual. This unit features a Ricoh drive teamed up with a 16-bit Adaptec 1522 SCSI host adapter. Once we got it installed, we found the performance mixed. XYXIS joined the five-way virtual tie for best motion-video segment performance and tied for second on the change attributes test. On the other hand, it was third slowest at deleting files and second worst at copying a 30MB file.

The XYXIS's $2345 estimated street price was better than only the expensive Sony. There's no toll-free support or service turnaround policy, although the tech staff was responsive. This drive is a so-so value at best; the Laura Technologies OptiPort TNT-3002I uses a similar Ricoh mechanism and beats XYXIS's performance for a lower price.

WHERE TO BUY

IBM Model MD3125B
800/772-2227,
800/465-1234

OptiPort TNT-3002I
Laura Technologies, Inc.
602/940-9800
Reader service no. 641

Liberty 115MO
Liberty Systems, Inc.
408/983-1127
Reader service no. 642

Vista 128
OCEAN Microsystems
800/262-3261,
714/898-1340
Reader service no. 643

Panasonic LF-3000, Ricoh 3000
Optical Laser
800/776-9215,
714/536-7990
Reader service no. 644

LF-3000
Panasonic
800/742-8086,
201/348-7000
Reader service no. 645

REO-130S
Pinnacle Micro
800/553-7070,
714/727-3300
Reader service no. 646

PLI Infinity Optical 3.5"
Peripheral Land Inc.
800/288-8754,
510/657-2211
Reader service no. 647

MEOD128
Procom Technology, Inc.
800/800-8600,
714/852-1000
Reader service no. 648

RMO-S350
Sony Corp. of America
800/352-7669,
408/432-0190
Reader service no. 649

XY128RW
XYXIS Corp.
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Reader service no. 650

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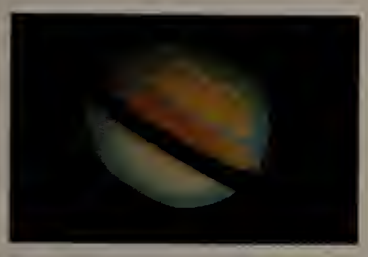

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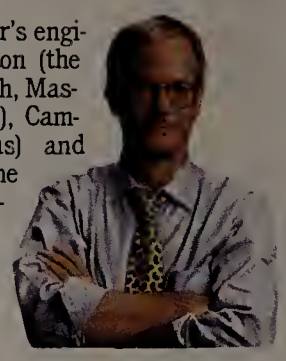

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No one else in the industry has taken the time to put your machine together like this. At best, they simply load the software onto the machine and ship it. And while DELL, Zeos and other computer resellers claim that they sell computers that have "exclusive" compatibility with various software and are guaranteed, only Tiger has individually OPTIMIZED and tested your machine for peak performance. And our guarantee? ONE YEAR, ON-SITE! Beat that. Isn't that what today's competitive world needs?

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The NEC PowerMate Image Series.

The NEC 486 machines fly — in both Windows and DOS. They come with the legendary performance of a world-class Intel microprocessor, the best in the business. You can choose from 25Mhz, 33Mhz or blast off with the 486/50Mhz monster. The PowerMate Series features NEC's Image Video, which is local bus technology for faster screen displays. Local Bus means that your video bypasses the system's expansion bus (running at only 8Mhz) and goes directly to the processor, running at full system speed. Of all PC components, this video enhancement gives you the greatest boost. Word processing documents, graphics, spreadsheets — everything — explodes onto your screen like never before. This technology increases screen performance by TEN TIMES. NEC was the first, and you won't get this built in advantage with the competitors.

The standard machines ship with 4MB of RAM, and Tiger will expand that for you to either 8 or 12MB. You get a 120MB hard drive and 3.5" disk drive. Check the price box for these system upgrades.

By the way, we customize your system to the memory you choose as well. The 4MB version will be configured for maximum performance, with a different set of specs for the 8MB machine. Dozens of technical enhancements will be made to your system depending on your memory and storage choices. No one else even thinks of doing that.

What Do We Actually Do?

Over 100 individual enhancements are made to your system to improve performance. Among these enhancements is a precise consolidation of the programs we load, for reduced path travel and faster, more efficient computing. We remove all the unnecessary filters and drivers that just sit there and take up space. We streamline the Windows parameter files and locate the SWAPFILES in the optimum place for both DOS and Windows. It took months to achieve this, working with the original developers, engineers and programmers. We also configure the memory to maximize your computer's interleaving routines and install RAMDRIVE on systems with anything over 6MB.

For Windows, we've taken the little mysteries out of the 3.1 environment, so you won't have to spend months trying to track down hang-ups and incompatibilities. With other computers, you're left on your own to read the industry magazines and technical manuals to do it yourself.

We've learned things about Windows 3.1 that only a small handful of industry insiders know about — and build them into your system before we ship.

NEC: Synonymous With Reliability.

These systems will be the state-of-the-art for a long time. NEC computers are designed and built in the USA, in NEC's Boxborough facility. They are exhaustively tested and re-tested to perform as promised. These machines are NOT built in Asia and re-labeled in America. The United States leads the world in computer technology — and that's where these NEC machines come from. Each part is premium quality, because your computer is only as reliable as its smallest part.

UPGRADE YOUR HARD DRIVE FROM 120MB TO 240MB FOR JUST $200 MORE!

UPGRADE YOUR MEMORY FROM 4MB TO 8MB FOR JUST $299 MORE OR TO 12MB FOR JUST $599!

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VISA, MasterCard, American Express & Discover accepted

486SX/25i: $2295!

s At NEC, Lotus, Symantec And Microsoft. Optimized For Instant Productivity.

THE TIGER/NEC BUSINESS BUNDLE

This is where it gets interesting. The Business Bundle includes your choice of the NEC PowerMate 486SX/25i, 486/33i or 486/50i with over $2500 in free, completely optimized software, loaded and ready to run. We start with Windows 3.1, the graphical user interface from Microsoft. We also include DOS 5.0, the ultimate operating system, along with an Logitech mouse and WindEase, a Windows 3.1 tutorial system — learn everything you need to know in less than an hour!

Then there's SmartSuite from Lotus. This is the hottest package in the business — including new Lotus 1-2-3 Release 1.1 for Windows, the incredible Windows spreadsheet that's swept the industry since its introduction; Ami Pro, the visual word processor; Lotus Freelance for Windows, the smart, easy presentation package and now — cc:Mail, the LAN-based electronic mail system.

This package is aimed squarely at savvy business users, bringing cc:Mail to network environments and unlocking new horizons in productivity and convenience. The cc:Mail single-user pack included in SmartSuite is ready to go, for instant communication on any PC or LAN you have.

SmartSuite also features a consistent set of icons, menus, tool — and of course, SmartIcons, so it all works together in a seamless, smooth fashion. Pass information easily between 1-2-3 and Ami Pro, or on to Freelance Graphics.

FREE Adobe Type Manager is included for crisp, clean fonts as well as a complete disk tutorial that gets you going immediately — because, after all, who wants to wait? There's also a 90-minute audio cassette from the Lotus Personal Training System that puts it all in perspective. Just pop in the tape and you'll be on your way to transforming your Windows desktop into an awesome productivity powerhouse.

NEC's IRONCLAD, ON-SITE WARRANTY

The best in the business is backed by a rock-solid guarantee. ONE YEAR, on-site service by fully-trained NEC technologies, Total Service Sites or factory authorized maintenance companies. When you receive your PC, you'll get an 800-number to call if you have the slightest problem.

HERE'S WHAT YOU GET

PowerMate 486SX/25i — includes 120MB Hard Drive and 4MB RAM	$2149.00 value
Windows 3.1	149.95 value
DOS 5.0 with Logitech Mouse	99.95 value
Lotus Smart Suite including	
1-2-3 Windows V1.1	595.00 value
Ami Pro 3.0	495.00 value
Freelance Windows	495.00 value
cc:Mail	295.00 value
Organizer Windows	199.00 value
Norton Desktop For Windows including Norton Desktop, Norton Backup and Norton AntiVirus	149.00 value
Wind•Ease 3.1	29.95 value
TOTAL RETAIL VALUE	**$4656.85**
TIGER SPECIAL — JUST $2295.00	

Complete NEC Business Bundles

BCF4757 **PowerMate 486SX/25i Bundle** **$2,295.00**
BCF4758 **PowerMate 486/33i Bundle** **$2,599.00**
BCF4759 **PowerMate 486/50i Bundle** **$2,895.00**

UPGRADES & OPTIONS

BCF4779 **Add 4MB RAM** for 8MB total **$299.00**
BCF4780 **Add 8MB RAM** for 12MB total **$599.00**
BCF4781 **Substitute 240MB Drive** instead of 120MB Drive included in Bundle **$200.00**

Monitor is not included in Bundle. Please call for available monitors. Lotus Organizer does not ship till Fall. You will receive a free coupon redeemable for the full Organizer package and Installation/Optimization disk.

Call Our PC Specialists: **1-800-395-8443** Int'l Orders: 305-443-8212

Call Tiger for details on extended service warranty.

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Attention QEMM Users: Get a REAL Memory Manager For Just $39.95!

386MAX Rips The Competition To Shreds! Here's The Proof:

REVIEWER'S NOTEBOOK: *The two leading memory managers have both released version 6.0s. Which one's better? Which one is right for your computer? Which one is faster, and which one will run your software?*

As Senior Writer at TigerSoftware, my job is to evaluate the latest computer products, understand what makes it tick, make sure it's the latest technology of the highest quality, and then write it all down for you — the Tiger customer.

So when I was given the task of testing and evaluating 386MAX 6.0 versus QEMM 6.0, the two leading memory managers, I knew I was in for some late nights at the office. But I did my research and I have the results. I recommend 386MAX 6.0 over QEMM 6.0, here's why...

Issue One: Compatibility With Windows

Tiger gets calls all the time from customers puzzled about why they can't use QEMM with Windows. They report freeze-ups, shut-downs and other strange occurrences. Our research turned up an interesting fact: QEMM goes into the actual Windows code and changes it! This is a programmer's nightmare — and extremely dangerous to anyone who considers their data important. System crashes are inevitable — and of course, they happen during the worst possible moment.

PC Computing, December, 1991

That's why we advise our customers to try 386MAX from Qualitas, the leaders in memory management. 386MAX maintains strict integrity with all Windows code. No funny tricks or reckless workarounds. 386MAX does it right.

Qualitas's 386MAX was the first memory manager on the market, and its initial set of features set a standard for the others to follow.

Beyond the issue of compatibility, 386MAX does things for Windows that QEMM hasn't even though of yet. Like allowing you to run multiple instances of TSRs in different DOS windows. 386MAX lets you load your favorite pop-up TSR, like Borland's SideKick, and use it in one DOS session from Windows, switch to another DOS session and use it again. Without the slightest problem. Don't try this with QEMM.

Without 386MAX's support, you'll probably crash whenever you pop up a TSR in one DOS window, switch to another DOS window, and try to pop up the same TSR. To do this, you need 386MAX. Plus only 386MAX allows you to load TSRs into high DOS memory within individual DOS windows. QEMM doesn't support multiple instances of TSRs from Windows. 386MAX does.

Issue Two: Speed

With power-hungry graphical applications like Windows and OS/2 appearing practically everywhere, the last thing you need is a slow computer. You need more performance from your memory manager — not less. But less is what QEMM dishes out to you! QEMM's Stealth technology degrades your overall system speed by as much as 40-50%, depending upon the configuration and the form of Stealth used.

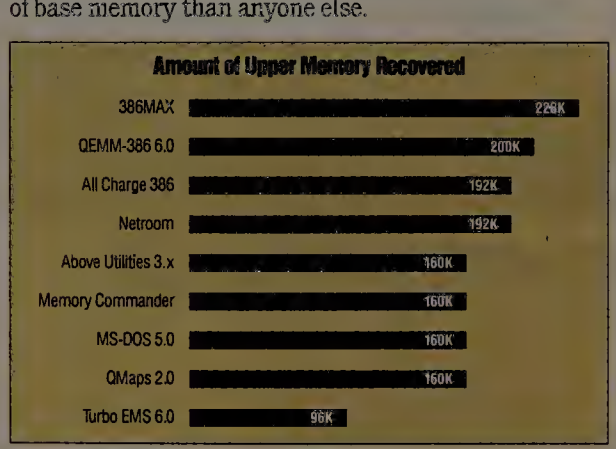
386MAX doesn't sacrifice speed. At Qualitas, they believe that speed is why you bought more memory in the first place. Speed to race through huge spreadsheets with blinding velocity. Speed to layout multi-page, graphical desktop publishing documents in a flash. Didn't you buy your computer with as much RAM as possible because someone said it would make your computer faster? (But then you found out you need a memory manager to put all that RAM to work.) Memory managers are supposed to put memory to work — making everything run faster, run larger files, and run more applications at the same time. But evidently, not everyone feels that way. QEMM sacrifices speed to load software high. Here are the facts...

What QEMM does is relocate your computer's basic housekeeping software — the System BIOS (which stands for Basic Input/Output System). The System BIOS usually resides where DOS can get to it fast — below the critical 1MB threshold. DOS continually needs to work with the System BIOS for things like getting data to and from your hard disk. It's something that obviously affects every aspect of your computer's performance. QEMM puts it out of DOS's easy reach — above the 1MB address — and it takes longer for DOS to get to it.

This means a much slower computer. So much slower that it's instantly noticeable. If you look on certain Bulletin Board Services under WordPerfect topics, you'll see a lot of complaints about QEMM 6.0 being very slow. Why did QEMM do this? Because it vacates a little more room in High DOS Memory for you to load software. But personally, I have my network software, CD-ROM software, scanner software, mouse driver, and a few other little TSRs loaded into high with room to spare. Without relocating the System BIOS, I still have room left over for more resident software. I don't need the extra room, I don't think you will either, and the price to pay for that small area is too much!

Issue Three: Performance

Are you tired of seeing "Out of Memory" messages? Then you need to see 386MAX. One of a memory manger's jobs is to load software out of DOS's vital 640K base memory and into the 640k-1024k high memory area. (And there are almost as many ways to do it as there are different types of PCs.) What this does is leave more of your 640k free to run final applications. Who crams more software into high memory? 386MAX. Tests after test prove that 386MAX moves more software out of base memory than anyone else.



8 areas were tested, including compatibility, memory handling, documentation and support. 386MAX not only took 1st Place, but was the only one to score "Excellent" in "Setup."
InfoWorld, December 9, 1991

Issue Four: Is Someone Playing With Numbers?

When I received my QEMM 6.0 Upgrade, I was a little disappointed. All I got were a few new features, a slim, brochure-like manual, and an order slip in case I wanted to pay for the real documentation. I thought to myself, this isn't version 6.0. It should be version 5.1.

When I received 386MAX 6.0, I was bestowed with a totally new and improved product on four main fronts:

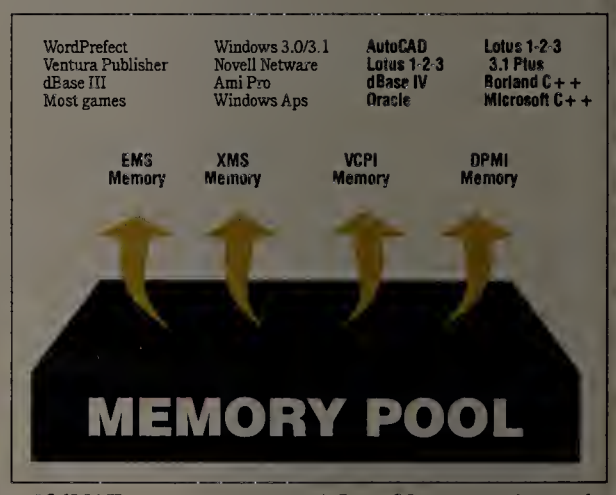
- **More Memory.** 386MAX 6.0 recovers more memory from more areas.
- **Better Optimization.** 386MAX 6.0 makes better use of that recovered memory with 386MAX-only features.
- **New, Easier Interface.** 386MAX 6.0 has a totally new look and feel. It's incredibly simple to install.
- **Better Performance.** Only 386MAX 6.0 has SmartMemory, providing the right kind of memory your applications need.

And to top it all off — 386MAX 6.0 lets me load resident software into High DOS Memory on my old XT* and 286s.

**386MAX loads software into High DOS Memory on XT's and 286s that have either an EMS 4.0 Expanded Memory board or ShadowRAM.*

Issue Five: What Kind of Memory?

Unfortunately, the world of DOS doesn't conform to just one standard. When it comes to memory, there are four popular methods to manage it. Four completely different ways to say which software gets how much of your memory. The final application you run everyday was designed to use one of these methods. But which one? WordPerfect wants EMS (Expanded) memory. Windows wants XMS memory. Which type of memory does your software use? If you're like most users, your not sure. That's why you need the kind of flexibility only 386MAX delivers.



386MAX manages memory with SmartMemory, pooling and distributing 100% of your memory the way it's needed.

386MAX gives you SmartMemory — the 100% solution for all your memory. SmartMemory takes your existing memory and turns all of it — 100% — into EMS for programs that want EMS. Then into XMS for programs that want XMS. 100% of your memory for the program you're running at the moment — in the way that program wants it. SmartMemory is the perfect memory solution. But that's not all...

SmartMemory is the ONLY memory manager that provides DPMI (DOS Protected Mode Interface) memory. This is the latest and greatest type of memory. Both Microsoft Windows and IBM's OS/2 2.0 give DOS applications access to extended memory via DPMI. Major companies like Lotus, Microsoft, Borland and others are jumping on the DPMI standard. Why? Because it's better. DPMI eradicates the problems of earlier standards. Problems that you know as frozen systems, hung computers and incompatible software. It's the standard of the future, but you can have it today — with 386MAX. (No, QEMM doesn't have it.)

"We looked at both of them (386MAX and QEMM 386) very closely, and we noticed something right off the bat: QEMM doesn't behave, and that's how this went from being a Testdrive of memory managers to one of 386MAX."
Inbound/Outbound, 3/92

386MAX 6.0

BCF3079-3 **386MAX 6.0 Upgrade** **$39.95**
BCF3079-5 **386MAX 6.0 Upgrade** **$39.95**
Requires 386 or 486 based computer, minimum 256K extended memory, PC/MS DOS 3.0 or later. Supports LIM 4.0 EMS, XMS 3.0, VCPI and Virtual DMA Services 1.0.

QEMM owners must supply serial number when ordering to receive $39.95 price.

Information & Orders: **1-800-888-4437** Int'l Orders: 305-443-8212 Fax: 305-529-2990 We Ship Via Federal Express

Circle 214 on reader service card

Make Your CD-ROM Reader Up To 1000% Faster

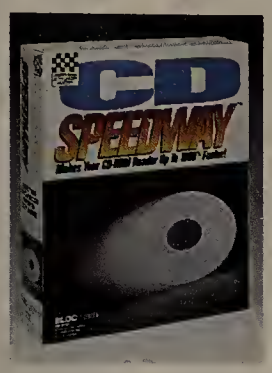
REVIEWER'S NOTEBOOK: *Just released and available only through TigerSoftware. One of the hottest breakthroughs in computing! The software solution to CD-ROM slowdown that increases your CD-ROM reader's speed by up to 1000%...The smartest new innovation to CD-ROM this year...Tested 100% compatible with the leading readers on the market today, including NEC, Sony and Chinon.*

We tested CD Speedway with dozens of popular titles, including four which are available with our NEC CD-ROM readers: Mammals, World Atlas, U.S.A. Atlas and U.S. History. We found spectacular speed improvements! Example: Mammals — displaying the order of mammals was 245% faster. U.S. History — Topic: abortion, complete listings 2100% faster! U.S.A. Atlas — Topic: education, 1300% faster, the second access was 6900% faster! CD Speedway actually gets faster as you use it. Browses, searches, retrievals are as fast as a hard disk.

With today's CD-ROM explosion, CD Speedway is the perfect product at the perfect time. And remember it's software, so there are no cables, boards or devices to hook up. CD Speedway makes efficient use of your system's resources to accelerate your CD-ROM reader and deliver scorching performance. It installs in seconds, is extremely flexible and simple to use.

CD SPEEDWAY Delivers Scorching Speed For Any Reader.

CD Speedway is the first cache designed specifically for CD-ROM readers. It will dramatically increase the response time for any CD reader from any manufacturer by hundreds of times! Many CD-ROM titles will run up to 2000% faster! In fact, we've clocked some titles at over 7000% faster! It's a new level of performance that will revolutionize the way you use your CD-ROM equipment — and make it far more productive than you ever thought possible.



Even complex color images will burst onto your screen with unbelievable swiftness.

CD SPEEDWAY

BCF8500 **CD Speedway** **$99.00**
Requires: 640K RAM, XT-Compatible PC or above and DOS 3.3 or higher. Uses just 19K RAM; can be loaded high. Caches to any disk device: hard disk, RAM disk, etc.

WATCH TV ON YOUR COMPUTER!

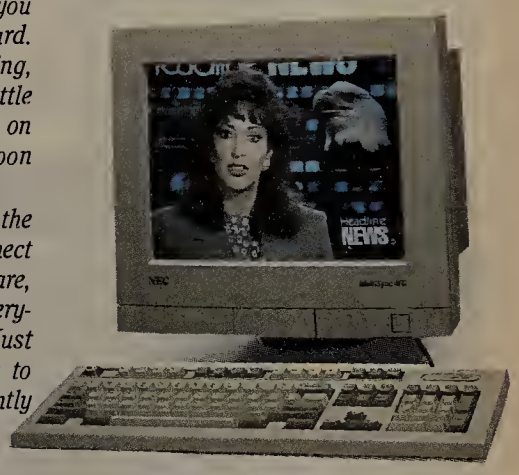
Full Audio And Video — 119 Channels And Cable — Right On Your Monitor!

REVIEWER'S NOTEBOOK: *The engineers at AView, makers of Desktop TV, have come up with one of the most fascinating new technologies we've ever seen. This patented add-on board (that installs easily into XT/AT expansion slots) actually delivers higher resolution than your TV set — full VGA quality picture. It is fully compatible with both DOS and Windows-based systems. Full audio/video capabilities, 119-channels, standard cable, VHF, UHF, VCR, video camera or videodisc — and you control it all right from your keyboard. Switch on ESPN when you're printing, watch the news, catch the Space Shuttle launches, follow the presidential race on CNN — or just have some mid-afternoon laughs with "Leave It To Beaver"...*

Desktop TV connects quickly to the speaker included in the box — or connect Desktop TV to your stereo. The software, all necessary connection cables — everything you need to start immediately. Just connect your coaxial Cable TV cable to Desktop TV and all channels are instantly available. Complete installation takes just a few minutes.

Is the reception really that good? We were skeptical, too. But the fact is, Desktop TV (running on one of our NEC 3FG monitors) actually looked BETTER than our 19" Sony Trinitron over in the conference room. It shouldn't be any surprise, Desktop TV uses an ITT chip set which provides double scanning and advanced interpolation technology, along with comb filters to minimize signal noise. Sounds complicated, but it means that Desktop TV rivals the expensive studio monitors used in television stations and production houses.

We found several other uses for Desktop TV: as a high quality television monitor in the workplace to view videocassettes, deliver video presentations, view closed-circuit broadcasts and interactive training.



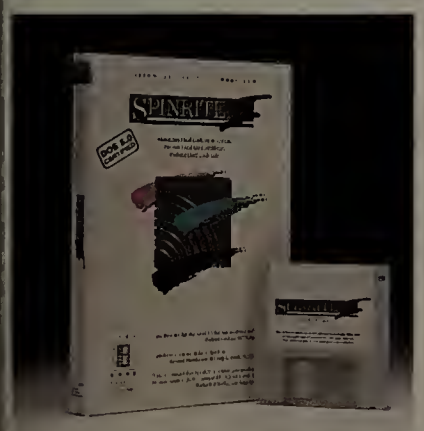
DESKTOP TV

BCF3882 **Desktop TV**
5¼" & 3½" **$299.00**
IBM XT/AT (286/386) or compatible; MS-DOS 3.1 or higher; controls available either through DOS, a TSR or Windows 3.0. Call for further details.

Stop Hard Disk Death! (Even After It's Too Late)

REVIEWER'S NOTEBOOK: *It's plain and simple: If you have a hard disk, you absolutely must have and use SpinRite II. You don't need to know how your hard disk works (although it will teach you if you like). You don't need to know why DOS just gave you a hard disk error, or why DOS says it can't find your valuable data. All you need to know is your hard disk is like everything else in this universe; it won't last forever. But don't despair, there is something you can do. With a little easy maintenance you can make your hard disk last longer, run faster, and run more reliably. Think of a hard disk as a car. Proper maintenance can make a car last indefinitely, and a little fine tuning makes it run so much better. Proper maintenance will do that for your hard disk too. SpinRite is the original in its class, and this all-new SpinRite II is still the world's finest. Take it from this Tiger Reviewer: No matter what other utilities you already own, get SpinRite II for your hard disk now.*

Byte Magazine summed it up best when they wrote, "SpinRite is what the word MUST was invented for." This vital maintenance software will give you years of extra hard disk life. It will recover valuable data even after DOS says it can't be found. It will make your hard disk faster (400 to 500% increases have been reported). And best of all, SpinRite II will do all this automatically and easily. You simply follow along as SpinRite II thoroughly checks out your hard disk and repairs everything it finds.



The user interface and easy-to-read manual are the best in the industry. Not because they're huge, scholarly volumes of intricate details (they're not), but because they're easy to follow, written in plain English, and the manual is just the right size to read and use. It's quite a relief to finally get your hands on a computer manual you can really understand and put to good use. And that's the overall theme of SpinRite II: easy-to-use. When you couple that with the fact that SpinRite is the world's first and foremost product of its kind, you get an unbeatable combination dedicated to not only the prevention of premature hard disk death, but its miraculous resurrection even after it's 6 feet under.

Hasn't Been Done Since It Left The Factory!

That's right. The most important information on your hard disk hasn't been renewed or changed since it left the factory. What information is that? It's the most vital of all, the identification addresses necessary for finding data on your hard disk. And since information on a hard disk is basically written with magnetized "holes," the magnetic properties can wear and lessen with age. What's more, the mechanical motions of a hard disk over the years (a hard disk continually spins at 3600 rpm) will cause the alignment of the mechanical parts to shift, thereby causing additional problems finding your valuable data. This ends up with a message from DOS saying your data can't be found. (Horrors!) How does SpinRite handle that? It actually rewrites all the original information on the hard disk, including the vital identification addresses. This alone adds years to the life of your hard disk, and all by itself would well be worth the price of SpinRite (but SpinRite does so much more). As a better-than-new bonus, SpinRite rewrites that data in such a way that the hard disk is actually faster than when it left the factory. That's right! Your hard disk is fine-tuned for maximum performance, as much as 500% faster!

Perhaps you're wondering what happens to your data while SpinRite does all this. It might appear that you need to backup your hard disk before SpinRite can "start from scratch." Worry not, because that's the best part.

HERE'S WHAT YOU GET: FOR ONLY $99.95

SpinRite	$89.00
Backup Pro Backup Software	$79.00
PC$^{R}_{X}$ Anti-Virus Software	$69.00
Trusted Access Security Program	$99.00
EZ-Boot — Reboot Software	$49.00
Software Carousel *Task Switcher*	$79.00

Value Of $464.00

ALL Yours For $99.95!

SPINRITE II

BCF7777 **SpinRite II 2.0 with Bundle** **$99.95**
Requires DOS 2.1 or above.

Circle 214 on reader service card

MULTIMEDIA PC

With All Software Loaded, Tuned, And Optimized For Maximum Performance

The Tiger/NEC MultiMedia Bundle.

This is the ultimate home and professional multimedia system for today — and it will remain on the cutting edge for a long time to come. Take your choice of 486/25i, 486/33i or 486/50i computers — and Tiger includes thousands of dollars of free multimedia equipment and software. You'll get the CDR 84M multimedia CD-ROM reader, the absolute fastest around, with swift response time, highest quality laser optics and guaranteed NEC reliability. Tiger and NEC have teamed up to create a machine finely tuned for maximum CD-ROM performance. Again, hundreds of enhancements have been engineered in.

You'll also get a state-of-the-art, 16-bit multimedia interface kit — the fastest made. Then you get the best multimedia speakers to blast that sound — the amazing Persona Micros. They are precisely engineered for multimedia sound and take up just a few square inches on your desk. We'll even throw in a 30-disc CD-ROM disc holder to store the discs we're about to give away...

Thousands Of Dollars Of CD Software!

Please read carefully — this will amaze you. It's an offer that's too good to be true, but is! Our CD-ROM collection begins with a host of reference titles including Multimedia World Atlas, an amazing CD-ROM with hundreds of megabytes of maps, information, charts and graphs. You also get U.S. Atlas and Automap on disc, along with The Toolworks Reference Library, including literally hundreds of facts, figures, people, places and more. The TIME Compact Almanac is a compilation of information from Time Magazine, the world's foremost news weekly. The Toolworks Illustrated Encyclopedia provides detailed information on a spectrum of topics and is a great source of information for school, home or office. The Guinness Book Of World Records will provides hours and hours of enjoyment, containing thousands of entries and Family Doctor is the complete source of medical and health knowledge. You'll also receive Symantec's Q&A on CD-ROM, the industry's number-one-selling flat file database. It's a business superstar; easy-to-use, powerful and ready to run. We round out the reference section with TigerDemos, which contains full-working demos of hundreds of current software titles.

We've also assembled five popular discs that are great learning tools for children, as well as a slew of captivating games for all ages.

This is a complete package for use at home, school or business. It's the perfect introduction to the world of multimedia. See the list (right) and compare. You won't find a better offer anywhere.

Monitor is not included in Bundle. Please call for available monitors.

NEC POWERMATE 486 MULTIMEDIA BUNDLES

PowerMate 486SX/25i	$2149.00
CDR 84M CD-ROM Reader	675.00
Complete 16-bit Interface MPC Kit	428.00
Persona Micro Speakers	80.00
30 CD-ROM Holder	29.95
Windows 3.1	149.95
DOS 5.0 with Mouse	99.95
Multimedia World Atlas	149.00
U.S. Atlas and Automap	99.95
Reference Library	149.95
Time Compact Almanac	199.95
Toolworks Illustrated Encyclopedia	395.00
Guinness Disc of Records	79.95
Family Doctor	79.95
Q&A	399.00
TigerSoftware Demos	99.95
Multimedia Great Cities of the World	99.95
Mammals	149.00
Time Table of History: Science and Innovation	99.95
U.S. History	395.00
Sherlock Holmes	69.95
Multimedia Mavis Teaches Typing	99.95
Multimedia Chessmaster	99.95
Game Pack II	79.95
Loom	79.95
Monkey Island	79.95
CD Speedway	99.95
CD Launch and Play Menu Disk	99.95
TOTAL RETAIL VALUE	**$6718.05**

TIGER SPECIAL — JUST $3395.00

CPUs

BCF4754 **PowerMate 486SX/25i Bundle**	**$3,395.00**
BCF4755 **PowerMate 486/33i** with all software	**$3,695.00**
BCF4756 **PowerMate 486/50i** with all software	**$3,995.00**

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BCF4779 **Add 4MB RAM** for 8MB total	**$299.00**
BCF4780 **Add 8MB RAM** for 12MB total	**$599.00**
BCF4781 **Substitute 240MB Drive** instead of 120MB Drive included in Bundle	**$200.00**

Instantly Turn Any PC Into A Fax Machine!

REVIEWER'S NOTEBOOK: *Your PC is the perfect fax machine: it easily creates documents to fax, it has powerful printing capabilities and contains plenty of storage space. It allows you to automatically transmit faxes at a certain time. You can send crisp, clean facsimile documents right from your desktop or laptop PC. With Faxography, included free with all Fax96 products, you can fax documents with 648 different fonts, graphics, special effects and more. Fax96 automatically previews the document on the screen so that you are faxing the file just as you would print it. Of course, using your PC makes it much easier to manage and archive your faxed communications. And, using your laser or dot-matrix printer, you can receive faxes ON PLAIN PAPER. All you need is the compact, affordable little board you see here.*

Tiger presents the price-busting fax board that has swept the industry, and captured *PC MAGAZINE's* "Editor's Choice" with its flawless reliability record. No other fax board can match Fax96's incredible 99.91% error-free transmission rating. In speed tests, using identical documents, Fax96 delivered a finished facsimile over fourteen seconds ahead of the nearest finisher.

The Fax96 screen looks just like your fax machine. View your document before you send it. Then, just click on "go" and the fax is on its way. A fast, streamlined interface makes Fax96 a snap to learn and use. It saves time, money and effort.

The list of features that Fax96 gives you goes on and on. Automatic transmittal cover-sheet generation with enough "comments" lines to be a short fax all by itself. Automatic redial in case the called number is busy. An automatic log of sent and received faxes. Printing compatibility with lasers and dot-matrix printers. And perhaps best of all, familiar "push button" fax machine feel.

The 1-Liner Advantage

Need to share the fax line with your voice calls? Only Frecom offers the integrated solution — Fax96 1-Liner. The problem — an extra phone line costs money. Avoid this expense. Receive faxes and voice calls on one phone line even when you aren't there. The 1-Liner is a built-in voice/fax switch on the Fax96 fax board.

Ever been on the road wondering "did I get that fax yet?" You need the FarFetchFax™ feature. Phone home and pick up your faxes as easily as picking up answering machine messages. In fact, do both at once. Listen to your phone messages, then enter your FarFetchFax code and tell Fax96 where to forward your faxes. That's unique. And every 1-Liner has it.

Fax96 With Powerful Modem

Add a high-powered modem to Fax96 for a dynamite PC communications combo. If you're short on slots or COM ports, this is a must. Both fax and modem fit on one board.

Or Fax From Windows

Now you can fax from Windows as easily as you print! Create fantastic faxes in Word for Windows, Ami Pro, even Corel Draw — then print to the Fax Window instead of your usual printer. Fax Window runs totally in the background, taking full advantage of Windows' multi-tasking capabilities.

All fax-modems for Windows include ComPort Manager — the new Windows technological breakthrough that allows multiple applications to use your ComPort at the same time.

Fax96 1-Liner Blow Out! SPECIAL $99.95

The Fax96 FAX Modems

BCF6250 **Fax96 With 1-Liner**	**$99.95**
BCF6255 **Fax96 With Modem, 1-Liner and DOS Software**	**$189.95**
BCF6256 **Fax96 With Modem, 1-Liner and Windows Software**	**$199.95**
WINFAST FAX AND DATA MODEMS FOR WINDOWS	
Winfast 9600 Fax Modem	
BCF6264 **Internal Model**	**$349.90**
BCF4746 **External Model**	**$399.90**
Winfast 9600 Fax Modem With One Liner Option	
BCF6263 **Internal Model**	**$399.90**
BCF4745 **External Model**	**$449.90**
Winfast 14,400 Fax Modem	
BCF6262 **Internal Model**	**$449.90**
BCF4744 **External Model**	**$499.00**
Winfast 14,400 Fax Modem With One Liner Option	
BCF6261 **Internal Model**	**$549.90**
BCF4743 **External Model**	**$599.90**

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M-F 8am-Midnight, Sat. 8:30am-8pm & Sun. 11am-5pm (EST)

TigerSoftware

800 Douglas Entrance, Suite 765, Coral Gables, FL 33134
VISA, MasterCard, American Express & Discover accepted

Yes! You Can Set Up Your Own Databases

Simpler Than dBase & Paradox, More Powerful Than Q&A!

REVIEWER'S NOTEBOOK: *Alpha FOUR has been a runaway best-seller since its introduction, allowing anyone to fully automate and computerize invoices, inventory systems, sales prospecting systems, customer lists and more. The reason is simple: Alpha FOUR requires NO programming. In just a few hours, you can create professional databases, customized to fit your needs.*

Alpha FOUR is the only database we've found that can be used right out of the box, without the tedious training time needed for the others. It runs from DOS, so you know it runs on any computer — lightning fast. But that's only the beginning...

The new Version 2.0 is packed with all the latest advanced features like network capability and 5 times the speed of the previous award-winning version. You really can do it yourself with this fantastic database and application development system!

That Monday morning I was ecstatic with anticipation. I work for a real estate office in FL. Just the night before I put the finishing touches on my new application, and it was time to call in the boss and my three realty agents to unveil my new creation. It was beautiful. A major step in handling our number one problem: disorganization causing us to lose prospects and valuable time.

Alpha FOUR Has Just Received
PC Computing
Best Value Award Aug. '92

At first they were skeptical. You see, I've tried other programs with them before, none of which were very impressive. But this time I was confident. I knew I had something to knock their socks off. They saw the colorful, easy-to-follow menus I had created. Their enthusiasm grew as they realized this could really help them. At the end, their applause was overwhelming as they congratulated me on my stroke of genius. (Of course, I didn't tell them how easy it was with Alpha FOUR.)

Here at Sunshine Realty we work hard to get new prospects. We're good at it. But our rate of turning prospects into customers was below average. We always had trouble keeping track of them and following up at the right time. I had to do something to stop this waste of valuable leads. So I decided to computerize.

A programmer friend of mine told me to buy dBase and create a database. So I did. Or at least I tried. It was a bomb. After a full week of trying to figure it out, I still couldn't create a simple menu for my new application. I just didn't know what to do. And the huge manuals were no help. Finally, I gave up.

With Alpha FOUR I can create custom applications in a fraction of the time I spend with other programs. It's the fastest, easiest database program I've ever seen.

I tried buying off-the-shelf Contact Management software packages, but they were no good. They all seemed to have a trillion things I didn't need which just cluttered up the screen. My agents wouldn't even attempt to use them because they looked like more work than they were worth.

Then I read about this new database for non-programmers like me: Alpha FOUR. It has all the power of dBase, but without any programming experience needed. So I gave it a try. Wow! Was I amazed! Within hours, I was busy creating a professional application that does exactly what I need it to do.

My Prospect Tracking application has beautiful screens that were incredibly easy to make. Using Alpha FOUR's Screen Painter, I simply drew a picture of what I wanted. Fields for the prospect's name, phone, lead source, follow-up date, even a memo field that's like a mini word processor for notes is all there. A colorful border and helpful instructions right on-screen tell my agents what to do. It's all so easy. I don't have to tell them anything. They merely follow along and reap the benefits of our own fully-customized, automated system.

I Set Up My Own Database In Minutes.

First, I needed a system of menus and sub-menus. Was I ever surprised to see how easy that was! With Alpha FOUR's "Application Editor" I wrote an outline of my menus and sub-menus. Alpha FOUR automatically created my multi-level menus right from there. Changing my menus was just as easy. I inserted and moved a few around until I got it just right.

Forms and Reports Look Great!

Alpha FOUR's Report Writer was even more impressive. I "painted" reports on-screen. They looked exactly like I wanted them to — much better than our old paper forms. This "What You See Is What You Get" approach to report writing gives me the flexibility I need to create meaningful and detailed reports that really get my point across.

Totally dBASE Compatible.

I was delighted to hear Alpha FOUR is totally compatible with dBASE .dbf files. Our mailing list went right into the new application without even having to be converted! And when my Alpha FOUR application grows, it'll import those Lotus 1-2-3 files used over in accounting. In fact, Alpha FOUR can import and export Lotus 1-2-3, Symphony, VisiCalc, PFS, MultiMate, WordPerfect and other packages.

And Now I Get Fancy...

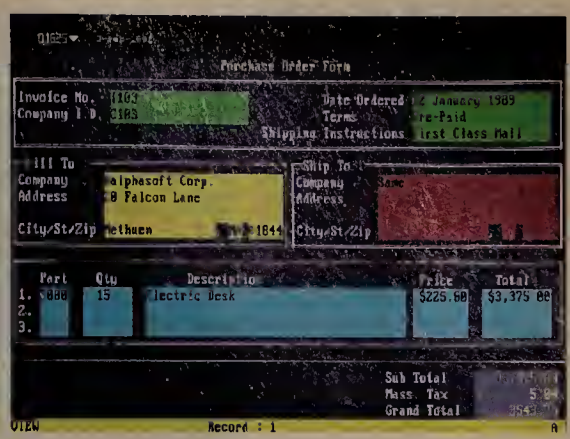
First I breezed through the tutorial just to get a fully operational application, but now I have the time to dress it up and make it fancy. First I'll change my menus to 3D boxes for the menu selections, and change some of the colors here and there. Alpha FOUR makes it all so easy. Then I'll customize some of the data entry screens so they look just like the paper forms the employees are used to working with. I know — I'll call up Alpha's free Bulletin Board Service and get some tips from other Alpha FOUR users.

Alpha FOUR is loaded with all the power I need:

- 128 Fields Per Record
- 256 Characters Per Field
- 4,000 Characters Per Record
- Unlimited Records Per Database
- Field Types: Character, Numeric, Date, and Logical
- Variable Length Memo Fields, up to 5,000 Characters
- More than 80 Data Manipulation Functions
- Up to 10 Databases Per "Set"
- Unlimited Number of "Lookup" Databases

With menu-driven ease, I create applications with Alpha FOUR that before I never thought possible. I don't need to be a programmer — I only need to know what I want to create. Alpha FOUR takes care of the rest. In just no time at all, I became an Alpha FOUR expert. I look for things to organize and put on the computer. I don't need a programmer. I do it myself.

Version 2 takes ease of use to a new level by allowing more productivity with less work. **Plus one of the great new features is network support.** Fully Novell and NetBios compatible (including LANtastic, MainLan, LANManager, Banyan and others), Alpha FOUR Version 2 allows you to actually create networkable applications by filling in one simple screen! All file and record locking procedures are handled for you — automatically. And although many database products are networkable, only Alpha FOUR Version 2 makes it so simple.



*Talk about ease-of-use combined with **power** — I can relate 3 database files together for my Invoicing application. Alpha FOUR gives me what I need for serious applications.*

PC WEEK Rated #1 — *Rated #1 May 14 1990 Version 1.1*
PC WORLD BEST BUY — *March 1990 Version 1.1*
PC MAGAZINE EDITORS' CHOICE — *December 1991 Version 1.1*
INFO WORLD EXCELLENT VALUE — *May 22, 1989 Version 1.1*
DBMS 1991 READERS' CHOICE — *December 1991 Version 1.1*

HERE'S WHAT YOU GET:

Alpha FOUR	reg. price $495.00
Personal Lawyer	reg. price $49.95
Corporate Ladder	reg. price $79.95
Dollars & Sense	reg. price $99.95
Zip Code Database	reg. price $49.95
Total Value	**$774.80**

ALL FOR JUST $99.90

Now When You Buy
THE ALPHA FOUR SERVER UNIT
You Get TWO Extra Network LAN Packs Inside Absolutely FREE! *($1047 Value).*

Alpha FOUR Version 2

COMPETITIVE UPGRADE

BCF3458-3	**Alpha FOUR Version 2 Non-Networkable** 3½"	**$99.90**
BCF3458-5	**Alpha FOUR Version 2 Non-Networkable** 5¼"	**$99.90**

NETWORK VERSION

BCF3459	**Alpha FOUR Version 2 Network Pack** Includes Network Server and 2 Network LAN Packs	**$399.90**

Information & Orders: **1-800-888-4437** Int'l Orders: 305-443-8212 Fax: 305-529-2990 We Ship Via Federal Express

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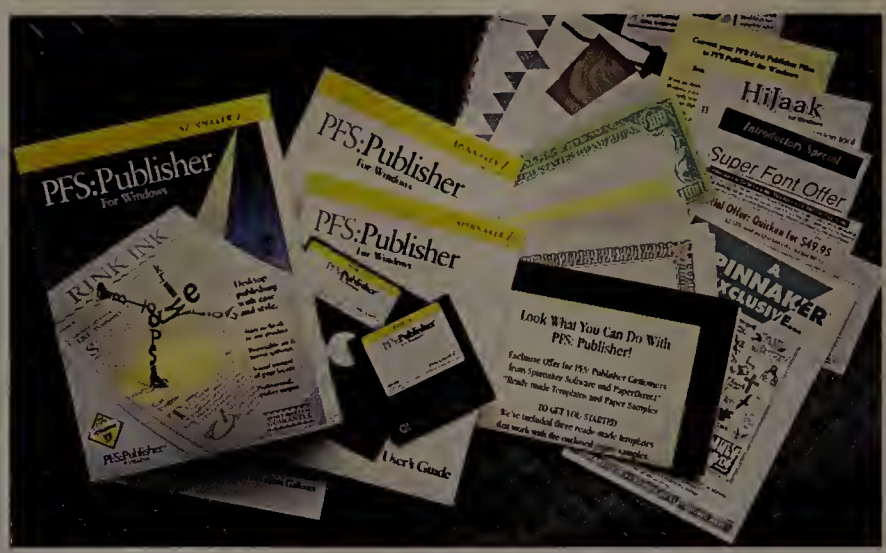
The Fastest, Easiest Desktop Publisher Ever!

Now, what you see — and what you can imagine — is what you can get. PFS:Publisher™ for Windows gives you complete freedom to create impressive advertisements, newsletters, brochures, business stationery, sales reports and more with ease. Browse through a full on-screen selection of templates, styles and clip art. Or import your own graphics. The powerful built-in word processor, format selections and drawing tools make PFS:Publisher the all-in-one solution for your current and growing business needs. First-time user or seasoned desktop publisher, you'll glide from initial concept into powerful finished output.

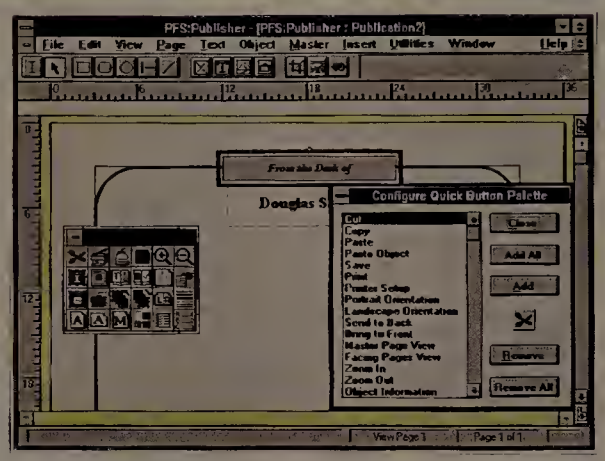


Start-To-Finish Desktop Publishing

It's all here: word processor, spell checker, thesaurus, graphics, fonts and layout tools. Write your text right in PFS:Publisher's powerful word processor or import from a wide range of other word processors. Use the automatic indexing and table of contents, then proofread and polish with the spell checker and thesaurus. Select the fonts and clip art that best suit your design and finally, print your creation on any Windows-compatible printer. The output will reflect your high professional standards.

Browsable Layout Catalog

Take an on-screen tour of the 50 professionally designed templates available for quick start-up. Or create and reuse your own formats. Add any commercial clip art to the over 200 images already in the gallery. And it's easy to import your own graphic creations, such as your company's logo. You can also crop, flip or rotate any graphic.



PFS:Publisher makes it easy to accomplish the most common tasks when you use Quick Buttons. With over 20 Quick Buttons to choose from no task is further away than a click of the mouse.

Visual Page Control

A little extra spacing here, a column specification there. You have complete — and completely automatic — control of every inch of your page layout. Enlarge your view up to 400% to fine-tune your line spacing, columns, gutters, leading and kerning. Or, reduce your view down to 25% and get an overall picture. With true WYSIWYG viewing, you're in absolute command.

Built-in Viewer makes choosing the right graphic a snap! Pick it, click it, and it's part of your document.

PFS:PUBLISHER

BCF7301 **PFS:Publisher** Dual **$99.90**
Requires 286/386/486 based DOS compatible computer with 2MB memory; hard drive and one floppy drive; VGA, EGA, Hercules or other compatible video adapter; mouse; DOS 3.1 or higher and Windows 3.0 or higher.

The Easiest Way To Print Address Books And Labels!

REVIEWER'S NOTEBOOK: *We've seen them all... every kind of printing utility known to the computer industry — only one is truly hassle-free: Easy Working Address Book & Label Maker. So simple, anyone can use it right out of the box, so powerful it handles any printing task with virtually no effort. You'll quickly knock out address book pages for your Day-Timer, Day Runner, Filo Fax and Running Mate, easily print any type of label, print envelopes in every conceivable format — and more.*

Choose from over 40 predesigned formats and a library of 16 FREE Bitstream fonts! And Easy Working Address Book & Label Maker includes a powerful compact database that makes it simple to create lists for printing. Shortcut keys and cross-reference options help you organize records for very selective printing. Or, import directly from dBASE. Your lists can be of any size — handles an unlimited number of records.

Easy Working Address Book & Label Maker supports just about any label format out there, including Avery mailing and shipping labels (#4144, 5160, 5162, 5262, 5197, 5164). You can print Rolodex cards, file folder labels — any way you like them. And you can customize them to suit any specific need. Supports over 600 dot-matrix, inkjet, daisy wheel and laser printers...

There's also a supply of free address book paper, ready to use.

Easy Working Address Book & Label Maker

BCF7304 **Easy Working Address Book & Label Maker** Dual **$39.90**
IBM compatible running DOS 3.1 or higher with 512K RAM. 2MB memory recommended.

The Complete Resume Package!

REVIEWER'S NOTEBOOK: *Of the resume programs we've seen, nothing compares to the depth and quality of PFS:Resume & Job Search Pro. It is comprehensive, easy to use, and gives you an enormous edge in targeting prospective jobs and presenting yourself in the best possible light. Includes 9 standard resume styles, and allows you to arrange your experience in chronological, reverse or true order...*

PFS:Resume & Job Search Pro includes automatic resume layout — just type in your information and the program does the rest! It contains 30 typefaces (plus your own resident printer fonts) for great-looking output from over 250 dot-matrix and laser printers.

There are also plenty of sample resumes and cover letters, designed by personnel professionals, and ready to use. A word processor and mail merge module enables you to produce your entire package — including envelope — in just a few minutes.

There's more: job hunting guide and set of helpful interview tips, action-word glossary and appointment manager. Includes Publisher's Powerpak fonts, International CorrectSpell English and Roget's II Electronic Thesaurus.

Don't mess around with your career. Put PFS:Resume & Job Search Pro to work for you and get the job you want...

Tips From The Pros...

Here are a few tips on getting the job you want, compiled by the editors of TigerSoftware:

Although there's no strict formula and every situation is different, the professionals suggest a sharp resume is the most important. You'll also need good interviewing skills, good contacts and a good agency.

PFS:RESUMEPRO

BCF7302 **PFS:ResumePro** Dual. **$49.90**
IBM compatible running DOS 3.1 or higher with 512K RAM. 2MB memory recommended.

Circle 214 on reader service card

THE NEW 16 MILLION COLOR HAND SCANNER

REVIEWER'S NOTEBOOK: *This amazing device makes its world premiere on these pages. TigerSoftware has been granted the first-ever commercial shipment of the new ScanMan Color hand scanners. It's an awesome instrument, loaded with breakthrough technology and sporting a sleek, designer look.*

Logitech ScanMan Color explodes with true 24-bit technology. In fact, it scans and displays all 16.8 million colors that the human eye can see. No dithering, no banding — ScanMan Color captures breathtaking, photographic-quality color down to the tiniest detail. Express your ideas and creativity on an entirely new level...

Two great new color-scanning milestones: first, the Logitech™ AutoStitch feature — it seamlessly merges multiple scans together to create large images. Nothing else can do this, and you can scan photos and illustrations in separate passes and AutoStitch "splices" them together. Perfectly. And the Logitech hand-scanners are the only ones with AutoStitch. The second breakthrough concept is in an advanced new fluorescent light source. It requires no warm-up time, doesn't overheat and produces a more consistent white light.

ScanMan Color scanner includes FotoTouch Color Image Editing software that offers a toolbox-full of enhancement tools and special effects. Manipulate scans to produce incredible images with paint and draw features. FotoTouch also includes AutoStop, a speed warning during the scan, auto-deskewing and monitor/printer calibration. Colors can be precisely matched on-screen to printed samples.

This is an amazing new device.

NEW COLORWORKS!
$495 Value — Free From Tiger

New ColorWorks provides over 450 creative tools at your fingertips. It's a new world of image editing, with dozens of never-seen special effects.

SCANMAN COLOR

BCF5288 **ScanMan Color** . . . **$649.90**
Includes Dual Media Diskettes.

LOGITECH MICE

TrackMan. The TrackMan Stationary Mouse gives you the precision of a mouse, but stays still on your desk. Logitech designed TrackMan so your fingers rest comfortably on the buttons and your thumb easily controls the ball. This advanced design features an ergonomic shape which is angled to fit your hand for hours of extra comfort and productivity.

TrackMan Portable. Whether you're on the road or in the office, TrackMan Portable puts Logitech power and convenience in a format that's ideal for portable systems. It attaches to either side of a portable keyboard and is comfortable with either hand.

MouseMan. MouseMan is not just another mouse. Designed with nearly a decade of mouse experience and the feedback of ten million users worldwide, Logitech's MouseMan is the next step in mouse evolution. In right-and left-handed versions, MouseMan provides maximum comfort, reliability and power.

Kidz Mouse. Fun and smart, Kidz Mouse puts children in touch with their computer so they can learn educational programs, do their homework and play games. Kidz Mouse is designed specifically for children.

The Cordless Mouse. The only problem with this new innovation from Logitech is that you'll have to get used to NOT POINTING IT AT YOUR MONITOR! The MouseMan is a cordless, three-button, radio-controlled mouse! No cables, no line-of-sight positioning!

ALSO AVAILABLE
FIRST MOUSE

LOGITECH MICE

BCF2588 **TrackMan Combo** . . . **$89.00**
BCF2591 **TrackMan Portable** **$99.00**
BCF2595 **MouseMan (Cordless Mouse)** **$99.00**
BCF2596 **MouseMan for Serial & PS/2** **$69.00**
BCF2589 **Kidz Mouse** **$49.00**
BCF2587 **First Mouse** **$49.00**

INSTANT DIGITAL SNAPSHOTS!

Introducing The Incredible New Logitech FotoMan...

REVIEWER'S NOTEBOOK: *What is it? In short, it's a portable, digital camera — for your computer. FotoMan takes great pictures with amazing clarity and 256 grayscale richness — then allows you to instantly download them to your PC. It includes a slew of image editing tools that open a world of creative opportunity, and is compatible with virtually all desktop publishing programs. The applications for this new technology are enormous. Insurance and real estate professionals are using it to expedite claims and transmit photographs of neighborhoods and homes. Manufacturers use FotoMan to quickly catalog products and parts, while law enforcement officials are using it to photograph suspects, crime scenes and evidence — without the time and expense of film.*

There are hundreds of practical uses for this new product, but we found FotoMan was also a lot of fun. It comes with an automatic flash, one-button operation and a field of focus from three feet to infinity. FotoTouch provides a sophisticated range of features including 256 grayscale editing. It's one of the hottest new ideas in computing: the digital photograph — taken by a small, portable and easy-to-use camera that allows instant transfer to your computer — without a digitizing board or other hardware.

In the past, getting a photograph into your PC meant using a traditional film method. The film would first be processed into either slides or prints, then scanned or stripped into your document. Now just snap a photo of a new employee, for example, and send it directly to the corporate database. Once the images are downloaded, FotoTouch shows you miniature versions so you can choose the image you want. When you've got your shot on-screen, the FotoTouch software allows you to easily make modifications. Then save your image in either TIFF, CCIT, BMP, PCX or EPS format. There's no film, no developing and no waiting!

LOGITECH FOTOMAN

BCF2592 **FotoMan** **$629.00**
Please call for system requirements.

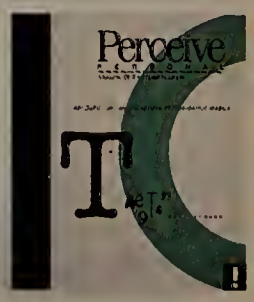
Merges Multiple Scans Together–Seamlessly!

When we first introduced the ScanMan Model 256 Grayscale hand scanner last year, it met with a roar of enthusiasm. We published the results of our testing — unbelievably sharp scans, with crisp, rich detail and 256 levels of gray. Scanning photos, illustrations — and text — was instantly taken to a new level. In head to head testing, we found the Logitech ScanMan Model 256 to be more versatile, faster and capable of producing large crystal-clear images. The 256 levels of gray add more depth and realism to all your scanned images. Logitech had created the ultimate hand scanner, the hottest new product of the year.

But when you work with Logitech, you come to understand that they never sit still. While the ScanMan Model 256 was sweeping the industry (*PC Magazine's* "Editor's Choice," *InfoWorld's* 1991 "Product of the Year," *PC Computing's* "Most Valuable Product of 1991"), they were at work designing an enhancement that would catapult it to another level entirely — a completely new category of scanners. The innovation: Virtual Page Scanning. The Technology: the Logitech Autostitching feature. It automatically "stitches" 2, 3, — even 4 scans together (so it can handle more area than an 8.5 by 11 flatbed scanner!). No other scanner we've ever seen can automatically merge scans into one completely seamless image. The ScanMan Model 256 smooths and de-skews the stitch, while evening the tones across the scans for remarkable images.

Clean OCR Scans...

Here's where the advanced technology of ScanMan 256 shows what else it can do. In our OCR testing, ScanMan 256 produced usable text with fewer errors — scanning faster than any other hand or full-page scanner.



FREE PERCEIVE PERSONAL OCR SOFTWARE
(A $99 Value)

Now Just $349!

LOGITECH SCANMAN

BCF2593 **ScanMan Model 256 with Perceive** **$349.00**
Please call for system requirements.

The Incredible $49.95 Dr. Halo Upgrade

Create, Capture, Paint, Correct, Manipulate And Convert Images!

REVIEWER'S NOTEBOOK: *There is no better package available for complete DOS imaging. Other packages give you bits and pieces, but none can compare with the vast capabilities of Dr. Halo IV. Create your own eyeball-grabbing images, capture existing images and work creative magic on them, or convert images to and from a variety of formats. It's all under one roof — officially known as the Dr. Halo IV Paint And Imaging Pak.*

Open the box and get ready for a slew of easy-to-use features, like large-image support, sophisticated palette support (up to 256 colors on any display), gradient fills that produce the smoothest shaded objects and background we've seen, support for all popular SuperVGA boards, incredible new printing capabilities for top-notch halftones and enhanced font support for great looking type.

DR. HALO UPGRADE

BCF3262-3 **Competitive Upgrade (Dr. Halo)** **$49.95**
BCF3262-5 **Competitive Upgrade (Dr. Halo)** **$49.95**
Requires 512K and hard disk. No free shipping on upgrades.

The #1 Rated Windows Imaging Tool

REVIEWER'S NOTEBOOK: *It's the best!... When PC Magazine reviewed image software just last month, they pretty much summed it up when they wrote, "HALO Desktop Imager easily steals the show from the competition", and gave it their Editor's Choice Award. With its amazing wealth of abilities to capture Windows screens, convert between different file formats, print spectacular multi-page output, apply special effects and more,*

HALO Desktop Imager is the #1 Windows imaging tool anyone working with images simply must own.

HALO Desktop Imager is the #1 solution for images in all your desktop publishing needs. Whether you're capturing screens for a User's Guide or importing images for a presentation, Desktop Imager is the one tool you can't live without. Everything you need is right here in this marvelous new product. Desktop Imager is not only a joy to work with (because of it's simplified menus and commands), its powerful and unique capabilities lets you do things you never thought possible. We fell in love with the Poster Print feature that lets you print an image up to a humongous 50-by-50 page poster. And the HALO-only print quality has to be seen to be believed.

You don't have to be a professional graphic artist to use HALO Desktop Imager. Even a first time user will be able to enhance their images so they'll look magnificent. HALO Desktop Imager has all the basic tools to make your color, black and white, or greyscale images sparkle with new life. Don't worry about different file formats because Desktop Imager lets you open, convert and save your files in the most popular file formats (TIFF, PCX, IMG, HALO CUT, GIF, TGA and BMP) for use in your desktop publishing program or favorite word processor.

Use a scanner? Now you can directly from within Desktop Imager using your black and white, grey scale or 24-bit color scanner. Desktop Imager even lets you capture 24-bit color screens from any Windows application. And if you have an EGA, VGA or SVGA monitor you can view and edit your 24-bit color or grey scale images using HALO's proprietary M/Color technology. You'll see incredibly vivid images on-screen as you edit your images and see the changes you make as you make them.When Desktop Imager says it prints - does it ever! You've seen poster-sized printouts and probably dreamed of having one at your next presentation, right? Well, now you can have quality, wall-sized posters with the click of a few buttons. Up to a mammoth 50-by-50 pages in size - all beautifully overlapping in just the right spots. Desktop Imager excels at printing with its advanced print functions. It's by far the most masterful printing capabilities we've seen.

Wall-sized posters are perfectly simple.

Features at a Glance

- 24-bit screen capture from any Windows application to any file format.
- Converts TIFF, PCX, TGA, IMG, HALO CUT, GIF, BMP and MSP.
- Supports color and greyscale scanners

DESKTOP IMAGER

BCF3129-3 **Desktop Imager** . **$99.90**
BCF3129-5 **Desktop Imager** . **$99.90**
Requires 512K and hard disk. No free shipping on upgrades.

Crosstalk Makes Communications Ridiculously Simple!

New Crosstalk Communicator Also Makes It Irresistibly Affordable...

REVIEWER'S NOTEBOOK: *The world of communications (between PCs, PCs to minis and PCs to mainframes) just got easier and much more affordable with the introduction of Crosstalk Communicator. This great new product gives casual users all the power and reliability of Crosstalk's industry-renowned Mk 4 communications package with a sleek, menu-driven interface that features a point-and-shoot Dialing Directory. A list of pre-defined entries for popular information services makes Crosstalk Communicator exceptionally easy to use.*

Get on line in just three minutes, transfer files, capture data or talk to other systems. And although Crosstalk Communicator is fast and easy, its features are rich and well designed. You get 13 terminal-emulation options including ANSI color graphics; Televideo 900 series; IBM 3101 character and block mode; and DEC VT52, VT100, VT102, VT220 and VT320. For file transfers choose from 8 simplified protocols including XMODEM (several flavors), YMODEM, YMODEM-G, ZMODEM, Kermit and CompuServe B plus.

Crosstalk Communicator supports over 50 modem brands; simply select the type you're using from the menu during installation. All in all, Crosstalk Communicator worked like a charm in our tests. File transfers were fast and error free (we used both 2400 and 9600 bps modems). The scripting is a true performer, including a built-in text editor and script compiler.

CROSSTALK COMMUNICATOR

BCF3097 **Crosstalk Communicator** **$19.95**
Operating system: *PC DOS or MS-DOS®, version 2.1 or newer.* ***Environments:*** *Microsoft® Windows, DESQview®, other windowing programs.* ***RAM requirements:*** *320 KB.* ***Speed*** *300 bps to 115,200 bps.* ***Communications devices supported:*** *Most popular modems, including Hayes®, Intel®, U.S. Robotics®, and other auto-dial modems.* ***Terminal emulators supported:*** *DEC VT52, VT100, VT102, VT220, VT320. IBM 3101 (block and character modes). Televideo 912, 920, 925, 950 series (including block mode). Generic TTY terminal. ANSI color graphics.* ***File-transfer protocols:*** *XMODEM (CRC, 1K, and CHECKSUM methods), YMODEM (including YMODEM-G), ZMODEM, Kermit, and CompuServe B+. No free shipping.*

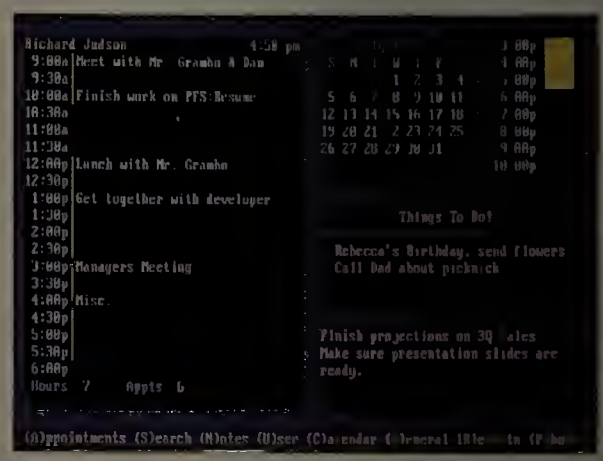
The Worlds Most Sophisticated Calendar!

REVIEWER'S NOTEBOOK: *Finally, a sleek, powerful scheduling system that's truly easy to use. In fact, About Time is easier and more flexible than any other software attempt we've seen — and actually more convenient than written calendars. It offers a unique new concept in scheduling multiple people and resources, with daily, weekly, monthly and yearly breakdowns, instant viewing and in-depth management of time and schedules. Create an unlimited number of calendars on a PC or network. Group Calendars, Appointments, Memos, Reminders and Things To Do are tracked for you — just "jot them down anywhere" in About Time.*

Need to track and schedule to the minute? Each user can instantly display their calendar in 1, 5, 10, 15, 30 minute or 1, 2, 4, 8 or 12 hour increments. Schedule individual appointments as well as recurring ones, and don't ever get stung by another "forgotten" conflict. Search for your appointments by key words, view appointments for multiple users concurrently — That's organization!.

Need to call a meeting with the whole gang? Let About Time automatically search for the time slots when all attendees will be free (that's a big time saver), or search for the next possible time when a facility will be open, or all the necessary equipment will be available. It can save hours of wasted time!

Print great-looking calendars and schedules for just about any scenario. Great for preparing itineraries for others!



Create recurring appointments with a touch of a key. Instantly find time slots when people and resources are available.

ABOUT TIME

BCF3301 **About Time** (Single User)..... **$79.90**
BCF3302 **About Time Network** **$295.00**

Circle 214 on reader service card

Information & Order Hotline **1-800-888-4437**
M-F 8am-Midnight, Sat. 8:30am-8pm & Sun. 11am-5pm (EST)

TigerSoftware

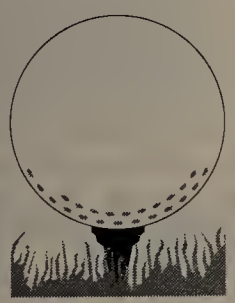
800 Douglas Entrance, Suite 765, Coral Gables, FL 33134
VISA, MasterCard, American Express & Discover accepted

263 Display Typefaces And 100 EPS Borders: $99.95

REVIEWER'S NOTEBOOK: *What's wrong here? Was that a typo in the headline or has Tiger Software lost their minds? No typo. No mind loss. Just a great value on a complete (and we mean complete!) library of 250 Type 1 or TrueType display faces for use with any application that supports PostScript or TrueType — and that means just about every PC application known. Includes screen fonts as well as printer fonts. Why pay more for foundry-quality type? Especially when you get these great collections of Ed Benguiat headlines and EPS borders free?*

Display typefaces — designed to attract attention to whatever you have to say. Take advantage of FontBank's staggering array of quality fonts at down-to-earth prices. 263 display typefaces and 100 EPS borders for just $99.95!

You'll create attention grabbing documents and eye stabbing graphic elements for any graphics program and desktop publishers. With such a wide variety of faces available to you, creating incredible headlines is fact, fun and amazingly professional. The headline is the face of good advertisements. Wimpy headlines are usually ignored, while bold headlines attract the reader, and if your message is important, the casual reader becomes curious — and persuaded. Remember, though, that headlines must be legible. If you'd like to know more about working with display faces and creating winning headlines, call TigerSoftware and ask for a free copy of a 24-page book that we've prepared entitled "A Short Course On Working With Type." It has been prepared by the typographers at Tiger and we'd be happy to get one in the mail to you.



FontBank has assembled a vast array of looks and feels in their type library. 250 different faces, each with its own distinct character. Some you may never have seen before. Combining FontBank's 250 faces with the capabilities of these programs offers the opportunity for an unlimited number of special effects. And FontBank display faces are compatible with all major page layout applications like Adobe Illustrator, Aldus PageMaker, Ventura Publisher, CorelDRAW! and Arts and Letters.

Regardless of what the design assignment, from flyers, posters, ads, coupons and greeting cards, to presentations, notices, memos and packaging, FontBank display typefaces give you the typographic tools you need to look your creative best. And, when converted to editable outlines using Illustrator, FreeHand or PageMaker 3.0, these faces can be used to produce special text and design effects to create stunning documents.

How long have you been using the same tired typefaces? Chances are, you use what you have because finding the right typefaces, installing them and learning to use them is more trouble than it's worth. so you compromise the overall look of your document by compromising on the one critical factor: the type. That's why FontBank is such an exciting product, easy to install, a pleasure to use — and a low cost way to improve the quality of everything you print.

Borders Complete Your Layout

Often the only thing between you an an attention getting layout is the lack of some visual ornament to pull it all together. Usually the answer is a border. But how many of us have the time to draw a border as the clock moves ever closer to the deadline hour?

Recognizing that need, FontBank has introduced BorderBank, a collection of 100 imaginative, attention-arresting borders in EPS (Encapsulated PostScript) format.

It's yours free when you order the Fontank Type Companion.

Designed by DTP guru T. Craig Smith, the BorderBank collection is an ideally quick and simple way to add a border to your ad, coupon, sidebar or just to pull your whole layout together.

The designs run the gamut from the traditional to cutting-edge contemporary. And using them is as simple as placing any graphic within your page layout or drawing program. Since they're EPS graphics, they proportion perfectly to whatever area you assign them to.

And they're yours free when you purchase the FontBank type Companion.

Total Design Power

There you have it. For $99.95, you can buy the FontBank Type Companion with its 250 display typefaces — and get 100 EPS borders designed by T. Craig Smith free. And with a little imagination you'll be creating layouts that make people do what you want them to do.

FREE! 100 EPS BORDERS $149 VALUE

No question about it: borders add excitement to your layouts. Order the FontBank Type Companion and get the collection of 100 EPS borders designed by DTP guru T. Craig Smith FREE! They are compatible with all page layout and most drawing programs.

Tiger Special Offer

FREE! Send in your FontBank registration card and get these 13 Photo-Lettering, Inc. Faces FREE! Chosen and edited by world renowned type designer Ed Benguiat. Also available separately for $9.95.

FONTBANK

BCF3425 **FontBank PC**
With Free BorderBank **$99.95**
Call for details.

Information & Orders: **1-800-888-4437** Int'l Orders: 305-443-8212 Fax: 305-529-2990 We Ship Via Federal Express

Circle 214 on reader service card

IMPOSSIBLE BUNDLE 2.0

Featuring New Ami Pro 3.0

REVIEWER'S NOTEBOOK: *Our original Impossible Bundle was so popular, we went back to work to make it even hotter in this new release. Impossible Bundle 2.0 is a "Your Choice" Upgrade — take the all-new Ami Pro 3.0, just-released Lotus 1-2-3 for Windows 1.1 or Freelance Graphics for Windows. Then add the award-winning MouseMan from Logitech with new Windows 3.1, 3-D Charts II, WindEase 3.1, OnTime for Windows, Mavis Beacon For Windows and New York Public Library Desk Reference for Windows.*

That's a lot of software for just $299...

If you haven't upgraded to Windows 3.1 yet, this is a great way jump into it with both feet. The Logitech MouseMan has been carefully designed for the graphical environment, with its ergonomic design, smooth movement and complete programmability.

The titles we selected are some of the most popular, including new WindEase 3.1, enabling you to learn Windows 3.1 in less than an hour. OnTime, a graphical to-do list manager, and NY Public Library Desk Reference offers facts and figures on thousands of topics. These are all new versions, hot off the press — over $673.00 in software value for just $299 — That's impossible!

The new Ami-Pro 3.0 is a spectacular upgrade to the industry's number-one rated word processor for Windows. Faster and easier, Ami Pro 3.0 also expands the creative possibilities of your PC. Ami Pro was conceived as a Windows word processor, built from the ground up to exploit the power and functionality of Windows.

If you're into the financials, choose The Lotus 1-2-3 Upgrade — the most popular spreadsheet around, combining the graceful Windows screen-display with the brute force of 1-2-3.

Or if you're the expressive type, choose The Freelance Graphics for Windows Impossible Bundle. Upgrade to the sleek presentation product that has swept the industry. Contains SmartMasters — just pick a background, insert your message — and the entire presentation, proposal, slide show or training session is automatically created for you.

The other program I know you'll love is Mavis Beacon Teaches Typing! for Windows. Great for computing-beginners and children.

All in all, the Impossible Bundle 2.0 Upgrade looks like another big hit.

Here's What You Get:

Freelance Graphics Upgrade	reg. price	$149.00
OR Ami Pro 3.0 Upgrade	reg. price	$129.00
OR 1-2-3 Windows Upgrade	reg. price	$149.00
ALONG WITH		
MouseMan/Windows 3.1	reg. price	$149.00
3-D Charts II	reg. price	$99.00
WIND•EASE 3.1	reg. price	$29.00
OnTime Windows	reg. price	$99.00
Mavis Windows	reg. price	$49.00
Desk Reference Windows	reg. price	$99.00
Total Value		**$673.00**

IMPOSSIBLE BUNDLE PRICE $299!

The Impossible Bundles

BCF5699 **Freelance Windows Bundle** **$299.00**
BCF5399 **Ami Pro 3.0 Bundle** **$299.00**
BCF5499 **Lotus 1-2-3 Windows Bundle** ... **$299.00**

Please specify 3½" or 5¼" disk size when ordering. Upgrade restrictions apply. Call for more information.

THE NEW 21Mb "FLOPTICAL" DRIVE

What would you say if I told you an ordinary looking 3½" disk could hold 21Mb of data?

REVIEWER'S NOTEBOOK: *PLI Floptical technology is one of the biggest leaps we'll introduce in this catalog. A single floppy — that looks like an ordinary 3.5" disk — that holds 21 megabytes of text, graphics, spreadsheets — anything! The Floptical disk drive also reads and writes ordinary 720K and 1.44Mb floppy disks, so you can upgrade your PC's capabilities with just a quick installation. It's an amazing new technology.*

Floptical technology can make a big difference in the way you work — no more backing up onto dozens of diskettes, no more splitting up files because they won't fit. Take 21Mb of information with you — on business trips, on vacation — or just back and forth between the office and home.

The PLI Floptical drive is masterfully built, just like the PLI removable cartridge drives that have become an industry standard. The disks are highly engineered for perfect performance every time. And the unique stamped optical servo tracks give the Floptical drive precise positioning of the read/write head, allowing track densities of 1245 tracks per inch, that's about ten times the track densities of ordinary floppies. Another important advantage: these embossed servo tracks cannot be erased or damaged, making Floptical disks safer than any other servo-based media.

NEW PLI "FLOPTICAL"

THE INFINITY FLOPTICAL.

It's the way to make sure backups get done. If you know how to use floppies, you already know how to use the Infinity Floptical. Backups are fast and reliable. You do not have to restore data to use it. The backup files are instantly accessible.

The Finest Removable Hard Drives Made.

Tiger Presents The PLI 44Mb And 88Mb Cartridge Drives.

Highly acclaimed, 100% reliable and backed by a solid warranty, the PLI line of removable cartridge drives is the most respected in the industry. When your files and applications grow to monumental size, when you want to perform fast backups or when you want to take heavy megabytes on the road — there're the PLI Infinity 44 and 88mb drives.

The PLI Cartridges carry a full 5-year warranty. One other note: The PLI drives and cartridges are thoroughly tested, far exceeding industry standards.

Designed and engineered for rugged use, the PLI Infinity 88 Turbo has the industry's highest tolerance to non-operating shock (our 88 Turbo once survived a four-foot fall onto a tile floor).

PLI DRIVES

FLOPTICAL DRIVES & MEDIA

BCF2462A **Floptical 21mb Ext. Drive** **$549.90**
BCF2462B **Floptical 21mb Int. Drive** **$489.90**
BCF2465E **Floptical 21mb Blank Media** 3½" .. **$69.90**

Interface Not included. Call For Models and Prices From $55.00.

REMOVABLE HARD DRIVES & MEDIA

BCF2460A **44mb External Drive Only** **$679.90**
BCF2460B **88mb External Drive Only** **$839.90**
BCF2465A **88mb Unform. Cartridge** **$149.90**
BCF2465B **44mb Unform. Cartridge** **$89.90**
BCF2465C **88mb Format. Cartridge** **$169.90**
BCF2465D **44mb Format. Cartridge** **$199.90**

Interface Not Included. Call For Models and Prices.

Circle 214 on reader service card

The Best Way To Start With Multimedia.

REVIEWER'S NOTEBOOK: ***What is this thing called multimedia? What can it really do? Find out now with this fascinating introduction to Windows 3.1 Multimedia!*** *The world of multimedia is a fascinating mix of sight and sound, combining realistic 3D animation, natural-sounding speech, orchestrated musical fanfares and swirling graphic images. It all comes together simultaneously under Windows 3.1 multimedia. Discover that multimedia is as easy as playing checkers. Simply move the parts along the unique "Timeline" until it's all arranged the way you like. Then sit back as your extravaganza of sight and sound unrolls before your eyes. It's amazing what multimedia can do, and MediaBlitz! is exactly what will introduce you to it!*

You're the director with the latest multimedia breakthrough — *MediaBlitz!* This is an absolute *must have* for every Windows user who wants to find out what multimedia is all about. Produce amazing animated shows, complete with music, animation and sound, that will leave your friends and associates dazed with awe.

With point and click ease, you assemble clips from existing multimedia files — or use the included 10MB of free multimedia files to start your library.

What can you do with your multimedia production? How about embedding it into a word processor or spreadsheet document? Click on the icon in your document and your multimedia extravaganza rolls out in full color, sound and animation! Won't your colleagues be amazed!

There's no limit to where you can use these great new effects to really get your point across. Create fascinating shows, tutorials, stunning documents and more with this easy-to-use introduction to Windows Multimedia.

See it in full-motion animation! Hear it in life-like digital audio! This is state-of-the-art multimedia — made Easy!

The no-charge routine module lets you freely distribute your shows as many times as you like. Next time you want to send a letter, send a powerful multimedia message instead for the ultimate in assertive communication.

Fast & Easy. No Programming!

Graphically create your clips with point-and-click ease using a timeline to create smooth-running, synchronized multimedia shows. In under 5 minutes! Arrange and rearrange until everything is just the way you want it. (After all, you're the director.) And all this without programming! It's unbelievably easy. You simply show where you want animations to be played on the screen and MediaBlitz! plays them!

What kind of files can you use with MediaBlitz? WAVE audio, CD audio, MIDI, bitmap images, animation and more are all easily imported into MediaBlitz! for incredible lifelike realism. Use your own, or start your multimedia library with the free 10 MB of sample files.

Fusing sight, sound and your ideas was never easier. It's the first really fun way to explore the fascinating world of Windows multimedia.

The makers of MediaBlitz! are so sure you'll love it, they're offering a 90-day unconditional moneyback guarantee. What are you waiting for?

- Explore full multimedia capabilities of Windows 3.1, and create your own multimedia shows.
- Includes sample shows and more than 10 megabytes of multimedia clip files.

MEDIABLITZ!

BCF3420 **MediaBlitz!** 3½" 5¼" **$95.00**
Requires 386/20 and above, 4MB RAM, Windows 3.1, VGA.

Instant Personnel Policies.

Actually Writes Customized Employee Handbooks For You.

REVIEWER'S NOTEBOOK: *Do you pay your employees during jury duty leave? Do you allow smoking, personal days, or leaves of absence? If you haven't given much thought to issues like these, you may be in for costly miscommunications. PoliciesWrite Now! is an easy-to-use product that helps you answer all the questions and avoid the costly mistakes. It asks you the key questions in any of the 66 policy subjects. Using your answers, the software writes the policies for you.*

PoliciesWrite Now! allows you to quickly establish personnel policies and avoid costly miscommunications. It is based on the highly successful Personnel Policy Expert, also from KnowledgePoint.

Custom-Writes Policies For You...

Policies Write Now! is designed for use in small businesses where there's limited personnel staff and where quick results are a must. Choose any of the software's 66 policy topics, and read concise background information on the human resources and labor laws that affect your topic. Then answer the questions posed by PoliciesWrite Now! and watch it instantly custom-write your policies for you. You can write any policy in minutes.

Built-In Editor.

Editing is fast with the built-in text editor. Or you can easily make final revisions with your own favorite word processor by exporting files to ASCII. All policies are dated for easy archiving, and PoliciesWrite Now! automatically creates a Table of Contents for you — no tricky word processing is required!

Topics Include:

Access to personal files, Bereavement leave, Child care benefits, Drug and alcohol use, Educational leave, Holidays, Immigration law, Vacation benefits, Work schedules, etc.

PoliciesWrite Now!

BCF3902 **PoliciesWrite Now!** ... **$199.00**
BCF3908 **Personnel Dept. Bundle**
Includes PoliciesWrite Now, AND DescriptionsWrite Now **$259.00**
Specify 3½" or 5¼" Diskette size. Call for details.

Instant Job Descriptions!

Actually Writes Customized Job Descriptions For You.

This brand new title just released by KnowledgePoint, the makers of PoliciesWrite Now!, gives managers and business owners the practical business benefit of clear and complete job descriptions in minutes. Covering more than 2400 job titles, the program gives you the ability to locate and merge language to clearly describe essential duties for any job. DescriptionsWrite Now! then asks a short series of questions and uses the answers to custom-write text that describes the job's supervisory responsibilities, qualifications, physical demands, and work environment. It's simple, easy-to-use and helps you to:

Be clear about hiring requirements before you write the recruitment ad • Hire the right person for the job. • Recruit more efficiently.

Give new employees a clear understanding of the job and your expectations. • Set the stage for good performance • Lower turnover rates.

Address performance issues fairly.
• Promote the most qualified candidates • Objectively discuss and correct unsatisfactory performance • Take disciplinary actions with confidence.

Compare your job descriptions with regional or industry salary surveys. • Offer competitive salaries • Recruit more effectively.

Comply with the Americans With Disabilities Act (ADA) and other employment laws. • Match the right person to the right job • Make fair employment decisions that you can defend in court.

Major Features

- **On-screen Human Resources Advice** – provides context-sensitive human resources advice on writing and using job descriptions

GET BOTH — SAVE $40

Tiger Bundle Gets You DescriptionsWrite Now And PoliciesWrite Now For $259.

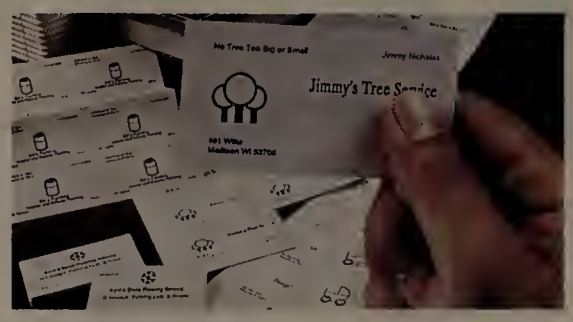
DescriptionsWrite Now!

BCF3904 **DescriptionsWrite Now!** **$99.00**
BCF3908 **Personnel Dept. Bundle**
Includes PoliciesWrite Now, AND DescriptionsWrite Now **$259.00**
Specify 3½" or 5¼" Diskette size. Call for details.

Circle 214 on reader service card

Instant Business Cards!

REVIEWER'S NOTEBOOK: *Since its debut in our catalog last issue, CardsNOW has become one of our top 5 best-sellers. It's the fastest, easiest way to create professional-quality business cards in just a few minutes; including crisp type and a collection of graphic images.*



CardsNOW is extremely easy to use, requiring just minutes to create your first card right out of the box. Just move the cursor to position the elements of your card and print — CardsNOW knows exactly how to print the cards on the paper (included free) for perfect business cards every time. The microedge perforated paper leaves no "stubble" when you separate the cards, so they look like printed cards.

Convenience is the keyword for this hot new product that everyone will need at some time.

In less than a minute, you can design, typeset and print custom business cards (including high-quality graphic images) on your HP LaserJet! CardsNOW! puts you in business today, and avoids the costly, time-consuming printing process. Includes enough paper for 250 cards (and you can order more at low prices — an order form is in the box), featuring microedge perforations for a clean, professional look. If you're on the road, keep CardsNOW! on your laptop and print cards on demand — or if you happen to run out in a tight spot.

Creating your own custom design (or duplicating an existing design) is simple. CardsNOW! features a sleek interface that enables you to design by just moving the cursor to locate type, art cuts or clip-art — anything you like! You can even scan in your logo and pop them right into CardsNOW! Clip art is included.

A library of 25 clip art images are included, just select the one you want, position the cursor and it's instantly inserted into your card. It couldn't be easier. Great for new company employees, family side-businesses — dozens of uses!

CARDS NOW

BCF3292 **CardsNOW** **$39.95**
IBM, AT, PC, XT, and compatibles. Requires 512K.

HOT CLIP-ART

The Logitech Modern Art Series is a library of high quality clip art collections for use with PC based desktop publishing, high end word processing and presentation graphics programs. The series consists of five collections with each collection containing a library of over 100 clip art images related through various themes. The titles of the five theme-based collections are:

- Newsletters, Symbols and Borders
- People, Places and Things
- Business and Professional
- Holiday and Special Occasion
- Sports, Recreation, and Travel

The Modern Art collection includes an installation program and the clip art image library for the particular collection (provided on both 5.25" and 3.5" diskettes).

The Modern Art images provide desktop publishers with a wide variety of easily accessible illustrations with which to enhance newsletters, flyers, invitations, advertisements and many other types of publications. The images are stored in disk-based libraries with pre-assigned names and are "pasted" into documents through applications programs such as Logitech Finesse, Aldus Pagemaker, Xerox Ventura Publisher, WordPerfect, and Microsoft Word.

So that the clip art can be used with as wide a selection of application programs as possible, all the Modern Art collections include the ability to store the images in seven industry standard image formats. Selected Modern Art images may be stored all in the same format or selectively in different formats. In addition, images may be stored as multiple copies in different formats.

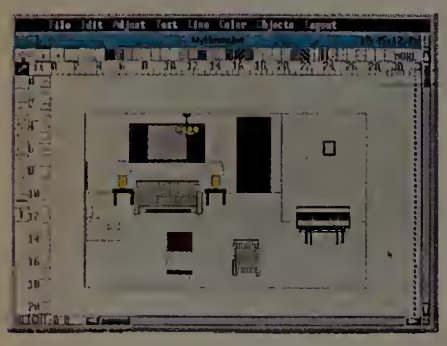
Pick one of 5 available packages, or get all 5 for $99.90.

Modern Art

BCF5005E **People, Places & Things** **$59.95**
BCF5005B **Newsletters, Symbols & Borders** **$59.95**
BCF5005A **Business & Professional** **$59.95**
BCF5005D **Sports, Recreation & Travel** **$59.95**
BCF5005C **Holiday & Special Occasion** **$59.95**
BCF5005G **ALL 5 Libraries** **$99.90**
Requires IBM PC, XT, AT, PS/2 or compatible systems, DOS 2.1 or later, one floppy drive and a hard drive. Specify 5¼" or 3½" diskettes.

DESIGN YOUR DREAM HOME

REVIEWER'S NOTEBOOK: *The Design Your Own Home Series, top sellers at Tiger for over a year now, are more popular than ever. Design Your Own Home Architecture enables you to quickly create precise floor plans for a new addition, remodeling or office layouts. Design Your Own Home Interiors makes you the interior designer, experimenting with different styles and materials. You quickly arrange and rearrange furnishings to come up with sensational new looks. Design Your Own Home Landscape helps you design and plan the perfect outdoor design. It's fast, fun and a great way to increase the value of your home or property.*

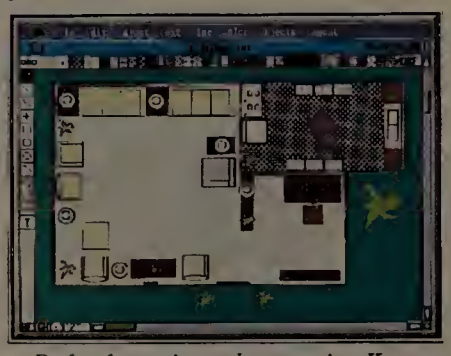


Anyone can be an architect! Easily design your dream home just like the pros!

ARCHITECTURE. Instantly draw floorplans, building side views and structural details. Rearrange your ideas, add notes and labels. Design Your Own Home automatically displays distances, areas and angles, and uses all appropriate standard architectural scales. There's a complete library of pre-drawn architectural shapes and symbols. Add color overlays of electrical systems and plumbing plans.

INTERIORS. Bring your own unique interior design ideas to life with Design Your Own Home Interiors. Arrange furnishings and they're automatically kept to scale! Explore the possibilities of color and texture. See 4 automatic side views of your top-view drawings. Select from dozens of pre-drawn furnishings and shapes and modify plans with a full set of drawing tools.

LANDSCAPE. Whether you do the work yourself or hire a landscaping firm, you must plan a landscaping project carefully to achieve great results. Design Your Own Home Landscape allows fast, easy planning with a variety of useful tools. Use one of the sample plans provided or create your own plan and see automatic side views of your top-view drawings. It also creates a shopping list for everything you'll need.



Perfect for moving and rearranging. Know beforehand exactly what fits best where!

DESIGN YOUR OWN HOME

BCF3101 **Architecture** **$34.90**
BCF3102 **Interiors** **$34.90**
BCF3103 **Landscape** **$34.90**

New Sprout!

GARDEN PLANNER

REVIEWER'S NOTEBOOK: *The first new release is Sprout!, a perfect addition to the Design Your Own Home series. This unique title actually helps you create the perfect vegetable garden. If you're new to backyard gardening, Sprout! tells you how to plant, when to plant, what plants grow best in your region, climate and soil composition. For the experienced gardener, there's plenty of useful information on planting various types of plants together for maximum yield.*

Railroad Mania

Design Your Own Railroad.

More fun and interactive than model trains, and they never fall off the tracks. This new title takes you back to the days of the magnificent steam engines and locomotives.

Design your railroad to any size or scale you like. You design the track layout, using special tools that keep curves aligned and precise. You can design layouts of any scale, with as many switches as you like.

SPROUT! & RAILROAD

BCF3107 **Sprout!** **$39.95**
BCF3790 **Design Your Own Railroad** ... **$49.95**
Requires 640K and hard disk recommended.

EVERYBODY'S PLANNER

REVIEWER'S NOTEBOOK: *Then we have Everybody's Planner, a sleek, easy to use program that is perfect for anyone who manages time, information, appointments and customers. There are actually two programs built into one: a powerful scheduler and a flowcharting program. Abracadata does it again — and again — with two new titles that are easy and powerful.*

Everybody's Planner is an affordable and easy-to-use project manager which contains two programs.

Suddenly, planning your projects is simple and fast — and you don't have to learn a lot of complex codes and commands. Everybody's Planner allows you to print 13 different report types that provide you with chronological and cost breakdowns — automatically.

Schedules creates critical-path-based P.E.R.T. charts and project calendars which provide plans up to 9 years long with 1870 tasks and 1000 resources. It features pull-down menus, current/alternate calendars, seven text and two graph (Gantt) reports, automatic or manual re-scheduling, and easy editing features.

Flowcharts, the second program in the package, uses 19 rotatable flowchart shapes in 9 sizes, vertical and horizontal labeling, and an Activation™ feature which uses color to depict flow sequences.

EVERYBODY'S PLANNER

BCF3106 **Everybody's Planner** **$49.95**
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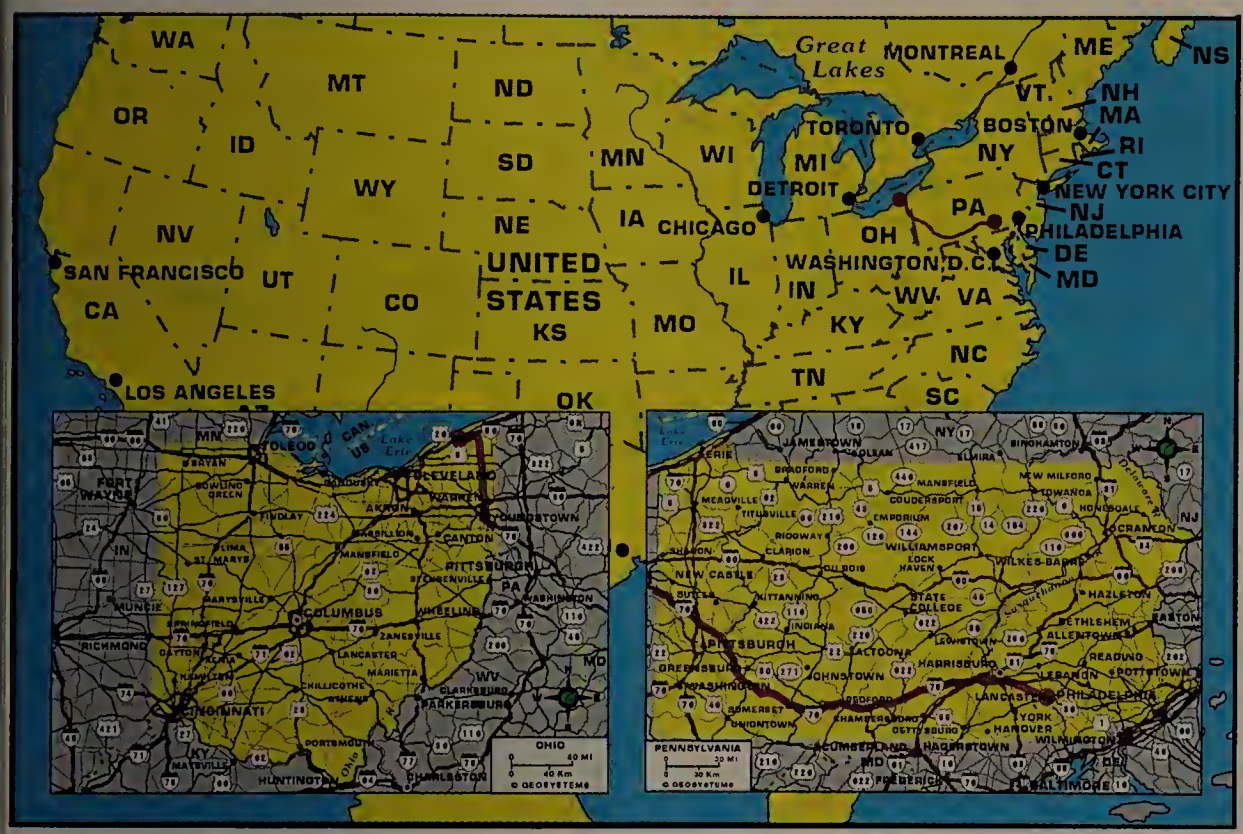
Plan Your Vacation Or Business Trip With Pinpoint-Precision!

WORLD PREMIERE! New Voyager™ From GeoSystems.



Brilliant maps from one of the world's most respected sources. GeoSystems clear, crisp images with your route highlighted for instant recognition. Here, a trip from Landisville, PA to Harpersfield, OH is shown. You select the most direct — or most scenic route.

REVIEWER'S NOTEBOOK: *Voyager is a CD-ROM based route planning system for Windows that provides clear, reliable directions TO any place — FROM any place in North America. Want to go from Disney World to the Grand Canyon? Just tell Voyager and in seconds you'll have complete directions with detailed maps and a highlighted route.*

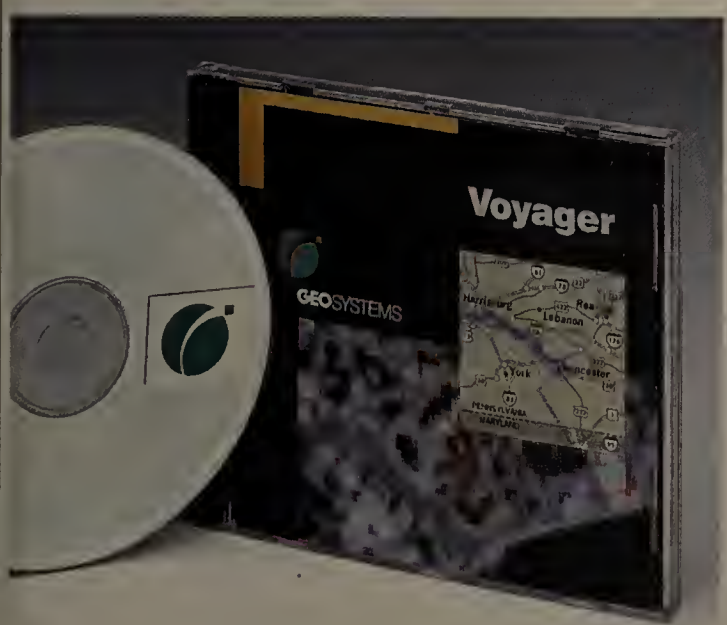
Voyager includes megabytes of handsome, comprehensive maps like the ones you see on this page. You select the most direct route — or take your time, enjoy the drive and pick the most scenic route.

Planning a vacation or business trip is as easy as typing in your starting place and your destination. Voyager digs into its massive database of information, maps and statistics — and provides an instantaneous route plan, narrative directions and points of interest along the way. Voyager contains over 140,000 places and over 425,000 miles of roadways in its database. That's virtually every road in North America. Voyagers database of routable places covers all of the US, Canada and Mexico and is nearly three times larger than competitive products' databases.

Voyager also gives you mileage and travel times, information on hotels and facilities, along with high-quality cartographic raster maps — they come up faster and look better than ordinary line drawings.

We were particularly impressed with the maps. They are gorgeous — and can be printed along with narrative directions for you to take along with you. GeoSystems is a major provider of customized maps of the world and travel information systems; they provide maps and services to National Geographics, United Airlines, OAG (Official Airline Guides), and many others. It's no surprise that the maps they've included in Voyager are so spectacular.

Voyager (shipping in September) is the first of GeoSystem's end user (commercial) mapping and locational products. It will be joined by a host of other products later this year. They will include in-city navigation and personal travel planning products that promises to revolutionize business and pleasure travel.



The Fast, Fun Way To Plan Your Dream Trip.

With Voyager, you've got the same technology that automobile clubs have been using for the last three years, on high-end computers. Over 1 million successful travel plans have been created with this technology! Now, your PC and CD-ROM reader can produce the same incredible results for just $149.00...

Introducing Voyager. Your Guide To The American Road.

Voyager is the first in a new line of products from GeoSystems. Their experience in creating custom maps, multimedia systems, and electronic publishing products makes Voyager highly accurate. And this powerful system is very easy to use, with a brilliant screen display and customization options.

In the map of this page, we've started with an overview of North America, then instructed Voyager to get us from Landisville PA — via the quickest route — to Harpersfield OH, two cities that don't even exist in competitors' databases. As you can see, the screen shows us the state maps of Pennsylvania and Ohio and then highlights the route. We could have chosen the smallest towns in these two states and Voyager would have gotten us there!

Information On Points Of Interest.

You can get a list of hotels, attractions, parks and sites located anywhere along your route. Print a list and you've got a complete travel guide — with directions — to use on the road. Voyager contains the freshest information from dozens of sources.

Directions for Landisville, PA to Harpersfield, OH

Distance for leg: 337.6 miles
Travel time for leg: 6 hours, 50 minutes

Beginning at Landisville, PA

DIRECTION	ROAD NAME	DISTANCE	TIME
West on	I-283	7.0 miles	8 min
West on	I-76	251.7 miles	5 hrs, 2 min
--Ohio--			
Northwest on	I-76	7.1 miles	8 min
Northeast on	I-680	11.8 miles	14 min
Northeast on	State Rte 193	1.0 miles	1 min

OK | Print | Previous Leg | Next Leg

Narrative directions for our Landisville to Harpersfield trip. A comprehensive, easy to understand guide with complete information on mileage (337.6 miles), travel time (6 hours, 50 minutes) and road names. Print your guide and take it with you.

We planned an imaginary vacation from Miami to historic Williamsburg, Viginia. We wanted to hit Disney World, Atlanta, Charleston and Asheville on the way. We've got limited time, so get us there the fastest way possible! Voyager took our list and — bang! A complete set of instructions and appropriate maps.

GEOSYSTEMS

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A Sweet Deal On The Industry's Best Type!

REVIEWER'S NOTEBOOK: *You already know that Adobe means the highest quality type. Now, 30 of the hottest faces (all Type 1 digital format) are assembled for use in any situation. There are text faces, headline faces, elegant and screamers!*

Type makes a difference! And these foundry-quality faces look crisp and clean down to the smallest point sizes — and up to the largest headline!

And Adobe means complete compatibility, you can use these great faces in Windows 3.0, Windows 3.1 and even OS/2. Mix them with TrueType, Intellifont and Type 1 typefaces. They're also printer-independent, so they'll print gloriously on your dot-matrix, inkjet, LaserJet or PostScript printer.

The Adobe Value Pack also includes Adobe Type Manager, which delivers crisp, sharp type in any application.

Decorative Headlines

AG Old Face Outline
Barmeno Extra Bold
Blackoak
Bodoni Poster Compressed
CASTELLAR
Colossalis
COPPERPLATE GOTHIC
Gill Sans Ultra Bold
Goudy Text Lombardic Capitals
Berthold Imago Extra Bold
IRONWOOD
LITHOS REGULAR
MESQUITE
Rockwell Extra Bold
Runic Condensed
STENCIL

Text

Gill Sans Condensed
Joanna Regular
Joanna Italic
Letter Gothic
Prestige Elite

Scripts

Bellevue
Biffo
Dom Casual
Xuptial
Pepita

Ornaments & Symbols

(Carta)
(Minion Ornaments)
Adobe Wood

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ADOBE

BCF4706 **Value Pack Fonts** **$49.95**

ADOBE ILLUSTRATOR 4.0 FOR WINDOWS — JUST $199!

Tiger Presents An Incredible Competitive Upgrade

REVIEWER'S NOTEBOOK: *The legendary creative environment now comes to the PC. Adobe Illustrator 4.0 for Windows enables designers and illustrators to flex their imaginations with a magnificent palette of features. Brilliant typographic controls — what would you expect from the leader in PC type technology? — and advanced color features set Adobe Illustrator far ahead of CorelDRAW!, Arts & Letters and Micrografx Designer — we'll tell you why below.*

Spend time creating — not studying the manuals! Illustrator is easy to learn and lightning fast when you swing into action.

Adobe Illustrator for Windows offers simple cross-platform compatibility with its Mac counterpart and even NeXT format. TigerSoftware is offering a competitive upgrade on this milestone release, so if you're using one of the other packages mentioned, you can propel yourself to the best for a very low cost — Just $199!

Adobe Illustrator for Windows includes Adobe Type Manager (for smooth, crisp fonts), 40 Adobe Type 1 scalable fonts (the best in the business), Adobe TypeAlign (for creative manipulation of your fonts) and Adobe Separator (for pro-quality color separations). There's more! You also receive a library of Adobe patterns, textures, symbols and borders from the Adobe Collector's Editions. And to round out this spectacular value, you'll also receive Adobe Streamline, (with retail version at $399 for a limited time only) which instantly converts bitmapped images, designs and illustrations (color and Black & White) to PostScript line art.

Give Your Imagination The Proper Tools.

Nothing outperforms new Adobe Illustrator for Windows 4.0. It quite simply provides the most comfortable environment for designers and illustrators. The illustration tools are beautiful, and you can edit them right on screen, in true WYSIWYG — no switching back and forth between preview and artwork modes. Designers can easily achieve tight layouts with total typographic control. Type can be manipulated to produce an unlimited array of effects. Choose from 16 million colors on your screen, create complex graphs, charts and information tables in a snap.

With the free Adobe products that come with new Illustrator 4.0 for Windows, you'll have a complete studio right on your desktop!

Adobe Illustrator 4.0 vs. CorelDRAW! And Micrografx...

No Comparison But Here's Our Report Anyway...

The free Adobe Type Manager, Adobe Streamline, 40 Adobe Type 1 fonts, Adobe TypeAlign and Adobe Separator alone put Illustrator 4.0 for Windows so far ahead of the pack that our comparison is a slaughter. Adobe type is the best, and the pros know that. The tools to create high-quality output are all here, including color separations.

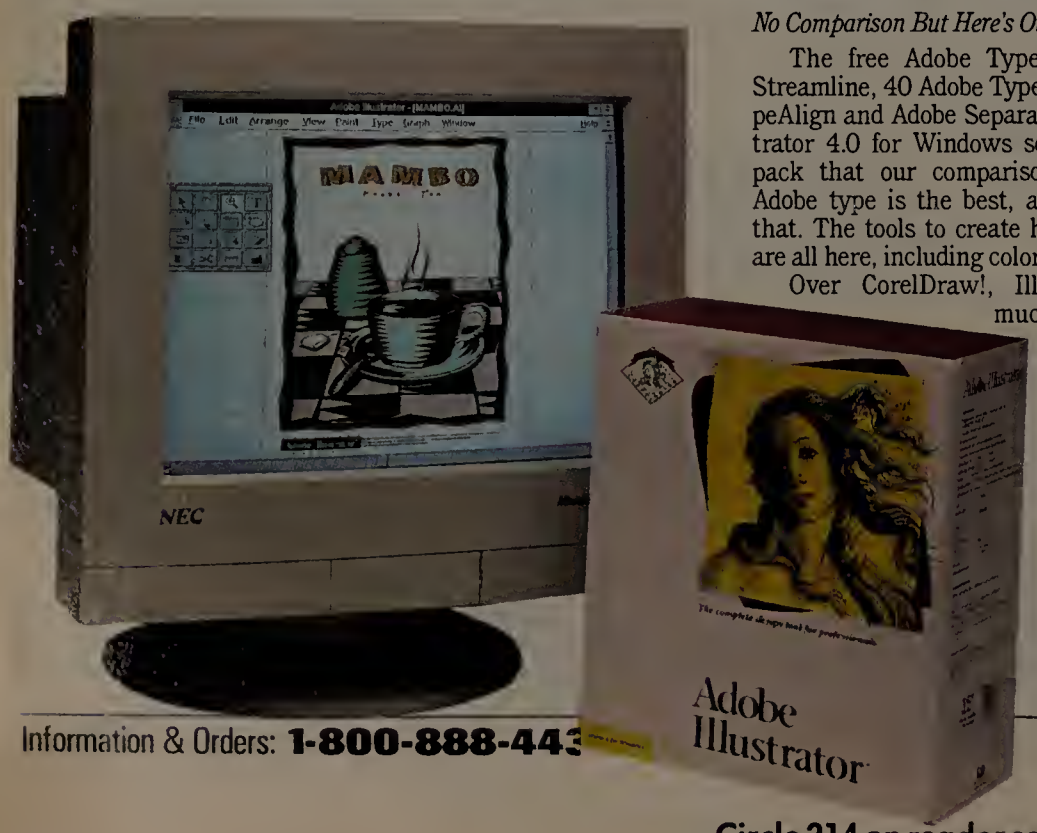
Over CorelDraw!, Illustrator provides much higher quality type handling. CorelDRAW! requires text to be entered into a dialog box, instead of directly on-screen. CorelDRAW! offers its own proprietary fonts (without true WYSIWYG display), while Illustrator provides the advanced technology of Type 1 fonts. And of course, CorelDRAW! offers no cross-platform support and no graphing features.

Incredible typographic illustrations are fast...

Micrografx Designer is difficult to learn, with a menu structure that slows the creative process. There are no graphing tools, no cross-platform support and it is limited to 256 colors on-screen. Nice try, Micrografx Designer, but you're too hard to use.

And finally Arts & Letters is not a professional-level package, and is designed for non-artists. No WYSIWYG text handling on-screen, extremely limited drawing capabilities. A product limited to 256 on-screen colors and without cross-platform support.

For our money, the ability to handle text is perhaps the most important aspect of any single-page design package. Type can make or break a design, or illustrated piece. Adobe has built Illustrator 4.0 for Windows around the concept of great type, true WYSIWYG and optimized performance. The advantage to creative professionals is enormous.



FREE WITH ILLUSTRATOR 4.0: ADOBE STREAMLINE

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ADOBE

BCF6363 **Illustrator 4.0 Competitive Upgrade** (5¼" or 3½") **$199.00**
BCF6362 **Illustrator 4.0 Retail With FREE Streamline** (5¼" or 3½") **$399.00**

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Breathtaking 16-Bit Stereo Sound From Your PC!

REVIEWER'S NOTEBOOK: *It's hard to believe. Sounds, music, voices — perfectly reproduced — from a disk. And not JUST sounds — 16-bit stereo that pumps out commercial CD-like sound for thundering presentations, interactive CD-ROM, riotous games, inspiring educational packages and pro-quality studio recording.*

Media Vision has just changed the face of desktop audio, introducing new versions to their line of powerful PC sound cards, featuring the all new Pro AudioSpectrum Plus (8-bit) and Pro AudioSpectrum 16 (16-bit) — the hottest, most advanced boards in the business today. The Plus and 16 are fully MPC compatible, compatible with applications using Sound Blaster or AdLib. Both deliver pure stereo sound — with sizzling high-range and luscious lows. It's amazing...The impact on an audience, a client, child or a student is tremendous. Both include a stereo waveform editor, SCSI interface, a MIDI sequencer, a text-to-speech synthesizer, a four track sampling application and a multimedia presentation-maker. PC Magazine's The Best of 1991, The Pro AudioSpectrums have more sound and fury than ever before.

PRO-AUDIO SPECTRUM PLUS

The Successor to the Industry legend, The Pro AudioSpectrum. The Plus delivers even more audio performance, with it's innovative shielded circuitry and dynamic filtering for clear, crisp reproduction. Produces magnificent, 8-bit, 44kHz stereo digital sound, with recording and playback, an advanced synthesizer, SCSI interface, fully MPC compatible mixer, and compatible with Sound Blaster and AdLib.

THE PRO SPECTRUMAUDIO 16

Can't get any better than this. The Pro AudioSpectrum 16 is identical to the Pro AudioSpectrum Plus described above — but with one important distinction: It explodes with FULL 16-BIT sound! Two 16-bit CODACs crank it up to produce sounds recorded and played back at 44 kHz.

MEDIA VISION

BCF6014 **Pro Audio Spectrum Plus** **$229.00**
BCF6016 **Pro Audio Spectrum 16** **$275.00**

Would You Watch TV Without Sound?...

Thunder Board for Windows.

Media Vision's Baby Boomer! Hot, digital sound on your PC! Tap into Windows 3.1's great new sound system, including synthesized music and digital audio. High-fidelity, 44 kHz, 8-bit stereo sound and full Sound Blaster and AdLib compatible — catch every voice, harmony and sound effect in today's games. The on-board FM synthesizer delivers 11 simultaneous instruments for rich, dynamic orchestrations.

NEW! AUDIO PORT "Audio To-Go!"

To round out the Media Vision line, here's a tasty little device for multimedia aficionados on the run: The Audio Port. This thing is about the size of an electric shaver — just plug it into your parallel port and you've got an external speaker for your PC! Full, rich sounds for notebooks and any IBM PC/AT, PS/2. Optimized for Windows 3.1, just plug it in and hear what you've been missing! Includes microphone/headset jack. Playback and record with this shirt-pocket-size wonder. Includes FM synthesis module to provide an orchestra of sounds. Buy the Audio Port and Tiger kicks in a free stereo headset and Trax MIDI software!

You won't believe your ears...

MEDIA VISION

BCF6011 **Thunder Board for Windows** ... **$129.00**
BCF6013 **Audio Port** **$159.00**

NEW "Thunder & Lightning"

Media Vision Presents...

Everything you've ever wanted to see and hear.

Thunder & Lightning is the ideal single card solution for your Windows 3.1 workstation. This truly multi-functional card combines stunning Super-VGA graphics with hi-quality audio. Providing color display of up to 16.8 million colors, on-board synthesis and audio digitizing/playback.

And of course the audio capabilities of the card are fully ThunderBoard, Sound Blaster, and AdLib compatible, providing the greatest games support available on the market.

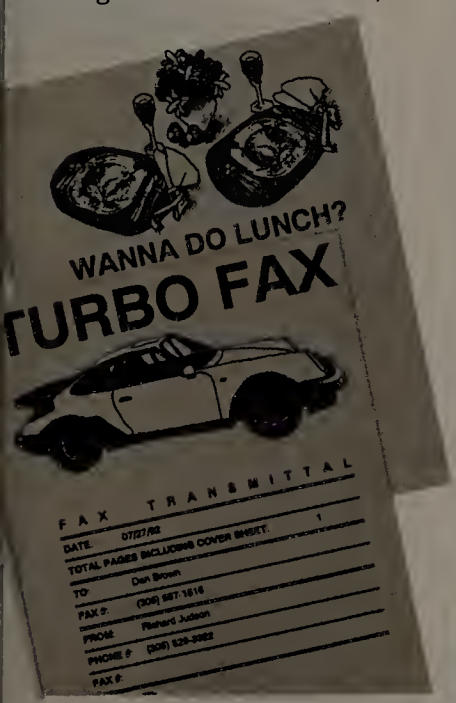
Additionally, *Thunder & Lightning* comes with drives for all popular applications, including graphics and AUDIO drivers for Windows 3.1, and a joystick port — making it the best single card solution for your PC graphics and audio needs.

MEDIA VISION

BCF6110 **Thunder & Lightning** **$249.00**

80 Fax Cover Sheets!

A fax cover sheet for every mood; every situation. A friend or associate's birthday? Send a birthday fax! Got a big announcement? Shout it out — with a customized fax sheet! Get serious and fire off an urgent fax. FaxMania is a smash hit, containing 80 great cover sheet templates, each professionally designed and ready to fax. Includes cover sheets for travel itineraries, international faxes, invitations, news flashes, a "Stowatch," a romantic "Flower Fax," thank-you faxes, ordering-from-restaurant faxes, and our favorite: "A Fax Called Wanda."



If you've got a fax machine, you simply must have this handy software title from T/Maker, the makers of Click-Art. They've taken their library and unleashed it on the fax machines of the world. Just call up a template, type in the faxee's name, your name, number of pages and message — and bang! You're ready to print and fax. FaxMania is extremely flexible and works with most leading word processors Microsoftword and Windows, WordPerfect and WordPerfect for Windows, Lotus Ami Pro to bring in longer text.

A quick word of congratulations to the artists and designers who created FaxMania... each template is wonderfully executed, imaginative and produced for maximum legibility on virtually any fax machine. FaxMania is the perfect accessory for your fax machine.

FaxMania is great for those times when you want to express a thought, an anxiety, your excitement — or frustration — but don't have time to put together a cover sheet that fits the situation. FaxMania's library contains all kinds of different cover messages; just call one up, fill it in and get your point across! *Call Tiger for FAX details.*

FAXMANIA

BCF3295 **FaxMania** Dual ... **$29.95**

The 5-Minute Multimedia Presentation!

REVIEWER'S NOTEBOOK: *This new product evolves your current presentations into outbursts of sight and sound, known as multimedia presentations. When I first saw a multimedia presentation, I was stunned. A friendly, natural voice from the computer invited me over. Then the presentation began with an orchestrated fanfare building to a blaring crescendo of horns and strings. The monitor screen exploded in full motion as animated characters provided unceasing action. I was enthralled. For the grand finale, I was presented with push-buttons to select what I wanted to see next. What a presentation! And all this from a 386 PC — which can be created in minutes?*

The future of presentations has arrived! Presentations using only screens plainly flipping one to the next are a thing of the past. Now you can infuse sensational sound, attention-grabbing animation and user-interactive push-buttons into your next presentation, even if you're a first-time Windows user. Imagine, everything you ever wanted your next presentation to be is now available — and best of all, it's easy to use, as simple as point, click and present! In fact, it's the easiest and most affordable multimedia presentation package for Windows 3.1 on the market today.

32 professional templates get you off to a fast start by establishing the overall background theme for your presentation. More than 80 sample WAVE, MIDI, animation and graphic files help you get started immediately, or import files from numerous other sources. Prompt your viewers with push-buttons, inviting them to interact with the presentation.

TIGER EXCLUSIVE

FREE Media Clips
A $59 Value

MULTIMEDIA MAKE YOUR POINT

BCF3421 **Multimedia Make Your Point** **$89.00**
Requires 386, 3MB RAM, Windows 3.1, VGA.

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The WINDOWS

CAN NORTON DESKTOP AND HP NEWWAVE TURN UGLY-DUCK

Windows is the program people love to hate. Sure, it's menu driven and graphical and uses a mouse. But it's also like living in a haunted house—you never know when a trapdoor will swing open and dump you in the basement.

This is hardly surprising. When you solder a multitasking operating environment (*Windows*) onto a single-tasking operating system (DOS), you don't get seamless computing. Still, most of us are willing to endure *Windows'* quirks and occasional crashes in exchange for the advantages of a graphical interface and thousands of applications.

Unfortunately, Microsoft has never really taken *Windows'* metaphor to its logical limit. Years after the Macintosh stunned the world with nestable folders and drag-and-drop file deletion, *Windows'* Program Manager is still stuck with inflexible program groups and no trash can. And though File Manager has improved, it still can't match the power of an *XTree* circa 1989.

Luckily, a welter of vendors, from software veteran Symantec to novice Paper Software, is taking *Windows* where no interface has gone before. We narrowed our list of contestants to shells that replace or supplement both File Manager and Program Manager and were *fully* compatible at press time with *Windows 3.1*—which in this case came down to two products, Symantec's *Norton Desktop* and Hewlett-Packard's *NewWave*. (For details on forthcoming *3.1*-compatible shells from other vendors, see "Best of the Rest.")

ILLUSTRATION BY TOM CUSHWA

SHELL GAME

ING WINDOWS INTO A GRACEFUL SWAN? BY ROBERT LUHN

In this shoot-out, we pit *The Norton Desktop 2.0 for Windows* against *NewWave 4.0*—the first major shells to exploit the powers of *Windows 3.1* fully. We put both shells under the gun in a number of key areas, from ease of installation to customizability, and picked a winner in each category. Throughout this grueling contest, we kept one question firmly in mind: Does this shell make life any easier for *Windows* users—or does it just add another layer of unnecessary complexity?

Windows cynics might assume that *any* modification to the environment would be an improvement, but as you'll see, not all shells are created equal. In fact, some are a waste of floppies.

A Tale of Two Shells

The term "*Windows* shell" is no oxymoron. Although Microsoft gave *Windows 3.1* a shot in the arm with OLE, TrueType, and multimedia features, it neglected to seriously revamp Program Manager and File Manager—the rooms where most *Windows* users live. *Norton Desktop* and *NewWave* represent the two divergent approaches to redecorating *Windows'* interface.

Norton typifies the don't-rock-the-boat philosophy—it extends and streamlines the *Windows* paradigm, giving you more of what *Windows 3.1* already has, along with some nice Mac-like touches. You can drag files just about anywhere and drop them on printer, trash, and other desktop icons for instant action. A nimbler, multipane file manager runs on the desktop for easier file manipulation. And for control freaks, *Norton's* menus and general operations can be customized to the max.

NewWave casts aside the *Windows* interface and replaces it with a rigid object-oriented system. You manage folders instead of subdirectories, and objects representing files and programs can be shuffled around in these electronic satchels without regard to where they're physically stored. As with *Norton,* there are drag-and-drop printer and trash can icons. Unlike *Norton, NewWave* doesn't really let you customize the interface, but you can call on a powerful macro recorder-cum-language to automate just about any task.

NewWave's object-oriented approach sounds great in theory, but in practice it's likely to confuse more users than *Norton* will. *NewWave* is tough to install and sluggish, makes artificial distinctions between programs, imposes perverse limitations (you can't easily associate DBF files with *Excel,* for example), and is stubbornly inflexible. While *Norton* is hardly perfect—you need a thorough knowledge of DOS and *Windows* to make it purr—it's a better bet while you wait for *Windows 4.0.*

Norton and NewWave Nose to Nose

Whichever program you choose, just keep in mind that strapping a massive shell like *Norton* or *NewWave* on top of *Windows* is like lashing a Winnebago to the top of a station wagon. *Windows* will strain under the load and run slower, and you can expect more glitches, more program errors, and even an occasional rude exit to DOS.

Installation and Setup

In the best of all possible worlds, a shell installs quickly and automatically, and smoothly translates all your existing *Windows* settings—application properties, shortcut keys, and so on. In reality, there are bumps along the road, but *Norton* makes the ride far less painful.

Like *Windows 3.1, Norton* tells you what files are being altered and asks for confirmation. You can selectively install modules, and *useful* on-line help is available at the click of the mouse. When the *Norton* desktop finally appears, all your original *Windows* settings have been honored—groups are maintained, icons are where they should be, and so on. If you're connected to a network, *Norton* recognizes the server volumes you have access rights to and adds the appropriate drive icons to the desktop. The only drawbacks? *Norton* consumes a whopping 9MB and pokes its fingers into every system file it can find. It also packs every drive with a hidden trash can directory that temporarily holds deleted files. If you don't configure the trash can properly, it can eat up a lot of disk space.

By comparison, *NewWave's* installation is downright puzzling. You're asked to calculate the hour difference between your time zone and Greenwich mean time (!), assign file extensions to *Windows* applications, and associate data files with DOS applications that will be installed under *NewWave.* You might ask why, since your PC has an internal clock, and file associations for your *Windows*

REPORT CARD

Norton Desktop for Windows Versus NewWave

Norton Desktop isn't a complete make-over for Windows—but it extends the interface, better integrates important tools (including a slicker file manager), and throws in a bundle of powerful utilities like Norton Backup. NewWave's inflexible object-oriented desktop is too clumsy and quirky to serve most users.

	Installation and setup	Compatibility	User manuals, help, and tutorials	Program management	File management	Customizing	Utilities	Performance	Service and support	Overall Value
NewWave 4.0	D	B+	D	C	D	D	D	D	D+	D+
Norton Desktop 2.0	B	C+	B	B	B	A	A	C+	B	B

The Battle for Windows' Desktop

In our Windows shells shoot-out, Norton Desktop hits the target more often than NewWave.

● Yes
○ No
◒ Deficient
n/a = not applicable

Standard features	NewWave 4.0	Norton Desktop 2.0
List price	$195	$179
RAM required (K)	500	300
Hard disk space required	7MB	9MB
Selective install/uninstall	●	●
Uninstall option	○	●
On-line help	●	●
On-line tutorial	◒	◒
Compatibility		
Windows 3.1	●	●
Windows 3.0	●	●
Runs in real mode (Windows 3.0)	○	○
Application shortcut keys	◒	◒
Start-up group	●	●
Working directory	●	●
Drag-and-drop	●	●
Mouse retained by windowed DOS app	○	○
DDE support	●	●
OLE support	◒	◒
TrueType support	◒	◒
Multimedia Extensions	●	○
Supported networks		
Banyan's VINES	●	●
LAN Manager 2.1 and later versions	●	●
NetWare 2.15 and later versions	●	●
Program management		
Replaces Program Manager	●	●
Replaces Task List	○	●
Nested groups/folders	●	●
View groups/folders as list	●	●
Long group/folder names	●	●
Runnable start-up groups	●	●
Customizable button bar	○	●
View applications as menu list	●	●
Password protect groups, icons, menus	◒[1]	●
Customizable menus	◒[2]	●
Custom nested menus	○	●
Tear-away menus	○	○
Automatic network installation	◒	◒
Save/restore desktop	●	○
File management		
Replaces File Manager	○	●
Drag-and-drop file copy/move	●	●

File management continued	NewWave 4.0	Norton Desktop 2.0
Drag-and-drop file loading	○	●
Drag-and-drop printing [3]	●	●
Drag-and-drop deletion	●	●
Drag data files onto desktop	◒	●
Customizable button bar	○	●
Password protect files, directories	○	○
Lock out file/drive/network functions	◒	●
Long file names	●	●
Open multiple drive windows	○	●
Format floppy disks	○	●
Copy floppy disks	○	●
Customizable menus	○	●
File finder	●	●
Text search	○	●
Number of file viewers	none	45
Right mouse button support	○	●
Utilities		
Text editor	●	●
Paint program	○	○
Hard disk backup	○	●
Tape backup	○	◒[4]
Backup to/from network	○	●
Enhanced macro processor/batch language	●	●
Enhanced calculators	○	●
Icon editor	○	●
Icon library	○	●[5]
Screen saver	○	●
Virtual desktop	○	○
Trash can	●	●
Unerase	●	●
Unformat	○	●
Disk repair	○	●
System information	○	●
Virus scanning	○	●
Service and support		
Money-back guarantee	60 days	60 days
Unlimited free support	●	●
Toll-free number	○	○
Daily support hours	10	10
On-line support	●	●
Fax support	●	●

[1] Only objects stored on the network server.
[2] Only the Tosk menu.
[3] Includes drog-ond-drop botch printing.
[4] Extro-cost option.
[5] 306 icons.

and DOS applications are probably already specified in WIN.INI. While you're at it, take up a hobby—installing *NewWave* takes close to 45 minutes.

But the shocker comes when *NewWave* finally loads up: It installs your *Windows* applications automatically and will recognize their data files if you add them to the desktop, but DOS applications are largely ignored. Worse, all the *Windows 3.1* groups you created are blown away. For some curious reason, programs that create files (like *WinWord*) are considered "objects" and are tucked into a folder that's accessible only via menu, while everything else is dumped onto the desktop regardless of how you previously organized it.

Adding DOS applications to *NewWave* after installation is a particular pain. One option conveniently loses the icons you originally assigned to the programs in *Windows*, forcing you to reassign them manually; another scans for all DOS programs on disk and in Program Manager groups and installs them in the *NewWave* environment. But in my test, *NewWave* found only 1 program out of 11. (The problem: *NewWave*'s data base recognizes only certain DOS programs—the rest must be installed manually.) And if you just drag an EXE or COM file from File Manager onto the *NewWave* desktop, you must load the program and save a blank file so that *NewWave* can register the data file's extension. It's a crazy process that no one should put up with.

Winner: Norton Desktop

Compatibility

The slickest shell in the world isn't much good if it chokes on your favorite programs or disables a handy function like *3.1*'s shortcut keys. Both *Norton* and *NewWave* ran every program I threw at them, from *Whiskers* (a mouse utility) to *Chuck Yeager's Air Combat* (a RAM-hungry DOS game), and both work with *Windows 3.0*. But when it comes to the finer points of compatibility, both shells come up a little short.

Norton is just buggy enough to undermine your confidence. If you change an application's assigned icon, *Norton* may freeze and leave you staring at a blank desktop. In some cases, if you abort a print job with *Norton*'s built-in text editor, you may find yourself unceremoniously kicked out to the DOS prompt. And *Norton* won't recognize shortcut keys assigned to DOS applications until you open each one's Properties dialog box and click OK.

NewWave is a bit stabler, but it suffers from video bugs. If you switch from the desktop to a full-screen DOS application such as *cc:Mail*, the screen will sometimes turn black. On rare occasions the mouse pointer becomes invisible—which makes sizing a window more fun than dialing a telephone with mittens on. Neither of the shells exploits TrueType or OLE, but they don't get in the way of applications that do.

Winner: NewWave

In NewWave, you don't run a program by double-clicking its icon. You create its file object type first (say, an Excel worksheet), then load that object.

Say good-bye to menus. To quickly filter the listings in a Norton file window, click the Filter button on the custom button bar.

Manuals, Help, Tutorials

In this mini-shoot-out, *NewWave* never got its gun out of the holster. *Norton*'s user and backup manuals are competent, well illustrated, and clear about what's happening during installation. The company also offers manuals on *Norton*'s batch language and networking issues. The user manual does fail to explain how you can drag and drop files on the *Norton AntiVirus* icon and how to use *After Dark* images with *Norton*'s own screen blanker. But these are quibbles. The *Norton* manual is generally solid, and on-line help is more or less context sensitive.

NewWave's manual, however, is a disaster—a jumble of tables, half-digested examples, and fuzzy explanations. This combination is deadly even for experienced *Windows* users, because *NewWave*'s approach to graphical computing is decidedly different and complex. You need a thorough, lucid overview of what's done and why, along with a lot of specific hands-on examples. HP supplies none of these. Most users will come away wondering how to delete tools, add data files to the desktop, or even set a password. You learn practically nothing about the *NewWave* macro language or how to configure the advanced features tantalizingly hinted at in dialog boxes. On-line help isn't much more specific, and *NewWave*'s error messages are opaque. For example, if a drag-and-drop operation fails, you're told that the 'Folder has technical problem DT150. Call authorized HP support representative'. My advice? Call Symantec instead.

Winner: Norton Desktop

Program Management

When I load up a *Windows* shell, the first question I ask myself is, Is it obvious where to start? *Norton* makes the grade; *NewWave* stalls.

Norton's desktop will seem familiar enough to *Windows* users. The menus are similar (though they contain many new options), and you can open established groups and double-click program icons to your heart's content. The welcome difference is that *Norton* integrates new items on the desktop—drive icons for file management and drag-and-drop tools for printing, deleting, virus scanning, file viewing, and file backup. Other niceties include the ability to put groups within groups and place data files on the desktop for quick loading.

Norton is the Burger King of shells—you can have anything your way. Copying icons and groups, creating groups within groups, customizing menus, deleting files, and running applications can be done via drag-and-drop, menus and lists, tool bars, or for the adventurous, macros or *Norton*'s own batch language. Some users may find this multiplicity of options confusing.

Norton's menus can also be perplexing. About half the menus list file management options, while others mix seemingly unrelated commands. If you want to reconfigure a program, do you click Properties in the File menu or Preferences in the Configure menu?

But you can get used to *Norton*'s ways pretty quickly. You can list your favorite dozen applications on a pull-down launch menu, run them with a single click, and never open a group again. Or you can drag a data file out of *Norton*'s file manager, drop it on a static program icon, and watch it load. To create a group within a group (something that *Windows 3.1* doesn't allow), simply open a group window and drag a group icon in. As with true Mac folders, a group's attributes and contents go with it, and its new status (as a child group) is recorded automatically. Other *Norton* procedures aren't so straightforward—instead of dragging things

Quest for a Counterpoint

by Bruce Kinnaird

NewWave and *Norton* were in town. Each claimed to be the best, and no desktop could hold them both. *PC World* dispatched Robert Luhn to oversee the showdown. A 10-year veteran of software wars, Luhn is tough but fair—a sort of Buford Pusser of the computing world. When the smoke had cleared from this shoot-out, however, we were shocked: *NewWave* lay riddled with holes, and even *Norton Desktop for Windows* was . . . just a shell.

Thinking perhaps Luhn himself might have been too quick on the trigger, we asked for second opinions. Miles B. Kehoe is the founder of Idea Engineering, a Silicon Valley engineering firm, the author of *NewWave and Windows: Getting It Right* (Van Nostrand Reinhold, New York, New York, 1992), and former technical marketing manager for Hewlett-Packard's Personal Software Division. Brian Livingston is the president of a Seattle *Windows* consulting firm, the writer of the *Window Manager* column for *InfoWorld,* and the author of *Windows 3.1 Secrets* (IDG Books, San Mateo, California, 1992). Here's what they had to say.

Kehoe on NewWave Versus Norton

Robert Luhn's review provides a reasonably accurate comparison of *Norton Desktop for Windows* and *NewWave.* The real problem here is caused by the method HP has chosen to market *NewWave.* Earlier versions of *NewWave* were not sold as alternative shells for *Windows.* Rather, *NewWave* was originally envisioned as an object-oriented environment, extending the power of *Windows.* Users were confused by this positioning, so HP now calls *NewWave* something most users can relate to: a *Windows* shell.

As Luhn points out, *NewWave* can intimidate new users. It is intended for sites where many systems are networked together and managed by an MIS staff. *NewWave,* with its powerful Agent Task Language, allows knowledgeable users and programmers to make a *NewWave*-based PC significantly easier for novices to use and for the MIS staff to manage.

Livingston on NewWave Versus Norton

I spent several days installing and configuring *Norton Desktop* and *NewWave.* I thought I would find some redeeming factors in *NewWave* that would allow me to balance in some way the findings that Luhn expressed in his review, but as it turns out, my views don't differ.

With the new features of the *Windows 3.1* File Manager, it may just be possible to customize your own desktop to fit the way you work—without buying a *Windows* shell. But if your choice is between *Norton Desktop* and *NewWave,* you'll probably find *Norton Desktop* offers you the best utilities for your dollar and interferes the least with the way you work.

around, you'll have to open menus, fill in dialog boxes, and call on your knowledge of DOS more than once. But managing programs and *Norton* is doable.

NewWave is another story. According to one industry wag, *NewWave* is a religion, and you're either a believer or an infidel. After struggling with *NewWave*'s dogmatic approach to handling programs and files, you may quickly join the ranks of skeptics.

NewWave complicates things by classifying icons as either objects or tools. Objects are data files and the programs that create them (like *PageMaker*); tools are single-purpose applications like spelling checkers. Objects can be stored on the desktop or in folders, copied or shared, dropped in the trash can, and E-mailed across a network. Tools are stuck on the desktop and can't be placed in folders—a major organizational headache if you have a lot of games, utilities, and other miscellaneous programs.

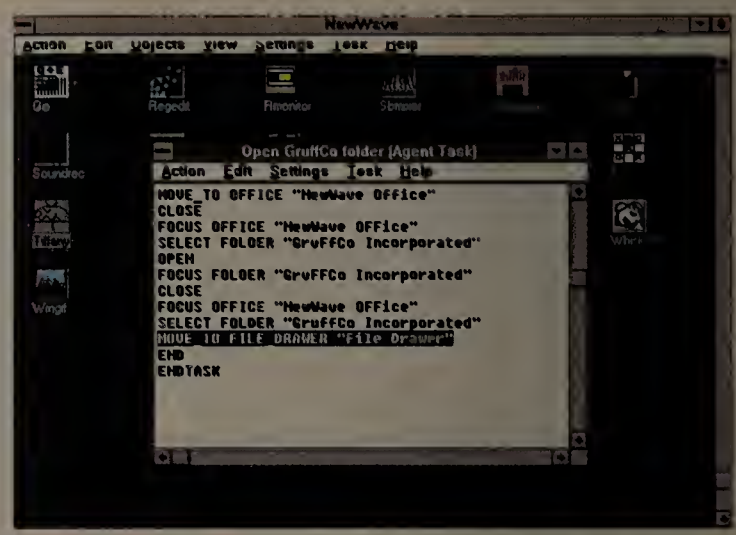
NEWWAVE IS ANOTHER STORY. NEWWAVE IS A RELIGION. AND YOU'RE EITHER A BELIEVER OR YOU'RE AN INFIDEL.

And there are bizarre exceptions. Objects like *Excel*, *WinWord*, and other general-purpose applications can't be placed on the desktop but are hidden in the cleverly named 'Create a New' menu. Click it, and up pops a window displaying the applications; if you double-click, say, *Excel*'s icon, the program won't load. You must first supply a file name that in turn generates an empty *Excel* object on the desktop. Double-click *that*, and *Excel* runs.

Other design decisions can also drive you batty. *NewWave*'s menu system is curiously organized—objects like *Excel* are found in the Objects menu, but the Find Object and Select All Objects commands are hidden in the Edit menu. Running multiple programs is problematic, because they're not listed in the Task List. Even removing a tool from the desktop is complicated. Instead of dragging the icon to the trash can as in *Norton*, you must open a copy of the desktop and select the icons you want to delete.

NewWave's one saving grace is its folders. They can hold as many as 200 objects (including other folders), and the desktop in turn can store 200 folders, as can a special file drawer. To fill a folder, just open it with a double-click and drag objects in. To copy a folder, select it and do a <Ctrl>-mouse drag. The only downsides: You can't place tools in a folder, and only one file drawer is available.

Winner: Norton Desktop



When you record a macro, NewWave generates the necessary code in a pop-up window.

File Management

When it comes to managing files, *Norton* and *NewWave* are as different as Ross Perot and Leo Buscaglia. *Norton* essentially offers a streamlined *Windows* File Manager. Instead of Microsoft's kludgy affair, you get an agile directory tree and multiple file panes that can view different drives and directories, which makes moving and copying data a breeze. To speed operations, there's even a configurable button bar that lists frequently used commands.

In *NewWave*'s object-oriented world, a traditional file manager is unnecessary. Once you transport data files onto the desktop, they're tracked for life. Since a data file is an object, it can be run easily from the desktop with a double-click, copied, linked to many folders and instantly updated across the environment à la OLE, and sent over a network. It's different but workable.

The snarl is getting data files onto the desktop. *NewWave* can automatically cull data files with the same extension and tuck them into folders. But if it doesn't identify the file extension with an installed program, it won't proceed—and *NewWave* is very finicky. For example, *WinWord* can easily read half a dozen file formats, but *NewWave* associates only DOC files with the program. To associate anything else—say, LET files—you must create a specific "bridge" file, which involves fighting through an endless stream of menus and dialog boxes. When you're done, you have two *WinWord* objects—one for DOC files and one for LET files. This design flaw seriously hampers *NewWave*'s usefulness.

In the drag-and-drop contest, *NewWave* is a distant second. You can place data files on the *NewWave* desktop, drag them to a printer icon, or dump them in a trash can, and that's about it. Worse, since the *NewWave* desktop can span several screens, getting a file at the bottom of the screen to the trash can or printer icon at the top means dragging, then scrolling, several times.

With *Norton*, drag-and-drop is a snap. To back up your hard disk, drag the drive icon over to the backup icon and let go of it; to scan a new file for viruses, pull it out of *Norton*'s file manager and drop it on the *AntiVirus* icon. The process isn't seamless—some "supported" files can't be displayed by *Norton*'s file viewer, for example, and drag-and-drop printing doesn't work with DOS applications. But by and large, *Norton* does it right.

Winner: Norton Desktop

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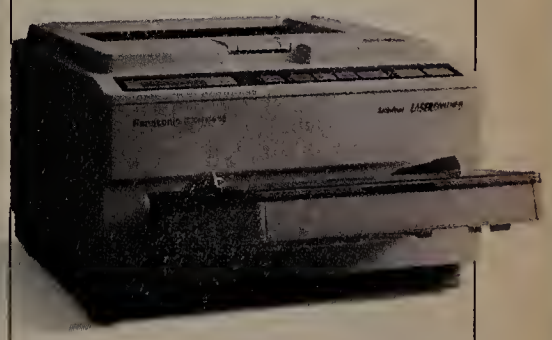

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Customizing

And the winner is . . . *Norton* again. Small wonder. *NewWave*'s interface isn't particularly malleable. You can add macros in one menu, control icon placement, dictate how some dialog boxes act, and that's about it. But with *Norton*, flexibility is everything.

For starters, you can whip through *Norton*'s Configuration menu and specify what tools should appear on the desktop and where, assign passwords, dictate when prompts appear, and so on. Next: Add programs to *Norton*'s launch menu. Simply open a fill-in-the-blanks dialog box, supply a name and executable file and path, and you're done.

Another step is modifying *Norton*'s own menus—a surprisingly easy task. The simplest approach is to take *Norton*'s existing menu and start modifying it. It's not exactly a graphical process—you pick supplied commands off a list, add custom ones on a command line, and so on. But even a programming-phobe like me quickly learned to change menu options, add completely new menus and commands, assign hot keys to menu options, and require passwords for just about anything. It's a little tricky managing the menu hierarchy, and as with all do-it-yourself programming, you can create endless loops and other digital half nelsons. But most intermediate *Windows* users can get the hang of it.

Those with a taste for *real* control can struggle with *Norton*'s macros and batch language. The macro recorder certainly beats *Windows*' own crippled version, but it's no *ProKey for Windows*. It records only keystrokes, and macros can easily run awry if the desktop differs even slightly from its state when the macro was recorded. With *Norton*'s batch language, you can create programs that prompt for information, display custom dialog boxes, issue DDE messages, create interactive training programs, and much more. But it's definitely for masochists—it's nongraphical, the syntax is fussy, and there's little in the way of debugging aids.

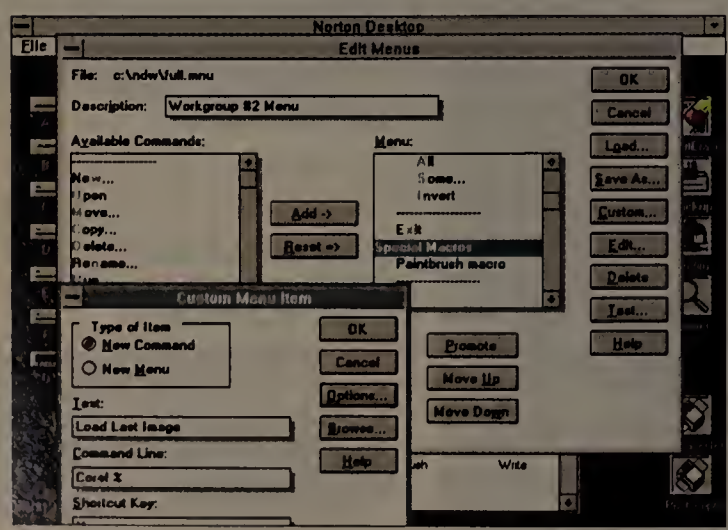
NewWave's macro recorder and language are a bit better. An experienced user can craft a macro that pulls data from an on-line financial data base, issues DDE commands that format it into an *Excel* report complete with graphs, and E-mails the entire bundle to selected users on the network. But like *Norton*'s offering, *NewWave*'s macro language isn't for dilettantes.

Winner: Norton Desktop

Utilities

Here *NewWave* ran out of bullets; it comes with a crude text editor, while *Norton* offers an impressive arsenal. You get full versions of *Norton Backup* and *Norton AntiVirus*, plus Disk Doctor (the hard disk repair module in *The Norton Utilities*), scientific and financial calculators, a file viewer, and more. It's a great deal—unless you already have backup and antivirus programs.

Winner: Norton Desktop



Creating custom Norton menus isn't impossible, but it's not graphical either.

Performance

Norton is no speed demon, but *NewWave* wins this reviewer's Golden Snail award. The reason, according to Hewlett-Packard engineers, is that *NewWave* is not unlike a data base, and a slow one at that. Do the simplest task—close a dialog box, move a folder, open a menu—and *NewWave* will poke around on your hard disk for 5, 10, even 15 seconds (and this on a 33-MHz 386, mind you). If you tell *NewWave* to add 50 *Word* documents to the desktop, take a coffee break. You'll have plenty of time.

Winner: Norton Desktop

Service and Support

Both Symantec and HP offer comparable and generous service and support: 60-day money-back guarantees, unlimited technical support, and so on. But when it comes to responsiveness and accuracy, Symantec clearly takes the lead. With HP, for example, instead of getting live human help, you often must leave messages on the voice-mail system—messages that aren't always returned. Worse, *NewWave* tech support sometimes gets crucial operations wrong, like associating a second file with an application, using bridges, and so on. *Norton Desktop* personnel, however, are Johnny-on-the-spot and well versed in the operation of their shell. They don't always get the answer right the first time, but eventually they do.

Winner: Norton Desktop

And the Winner Is . . .

. . . *Norton Desktop* by about 10 furlongs. *Norton* doesn't radically reform *Windows* or give it an object-oriented facelift, but it works, and it's far easier to learn and use. However, it doesn't merit a Best Buy. It's still oversized, difficult to configure, menu happy, and just a wee bit buggy. In short, it's a good value, but not a must-have.

Remember that when you buy a full-service shell like *Norton* or *NewWave*, you're buying into a philosophy you may not like—and kissing a lot of hard disk space good-bye. For many *Windows* users, such shells may be overkill. If you need simple program control or a better way of handling files, programs like *SideBar* may be a better bet.

Robert Luhn is a contributing editor and Bruce Kinnaird an associate editor for PC World. *They can be reached on PC World Online.*

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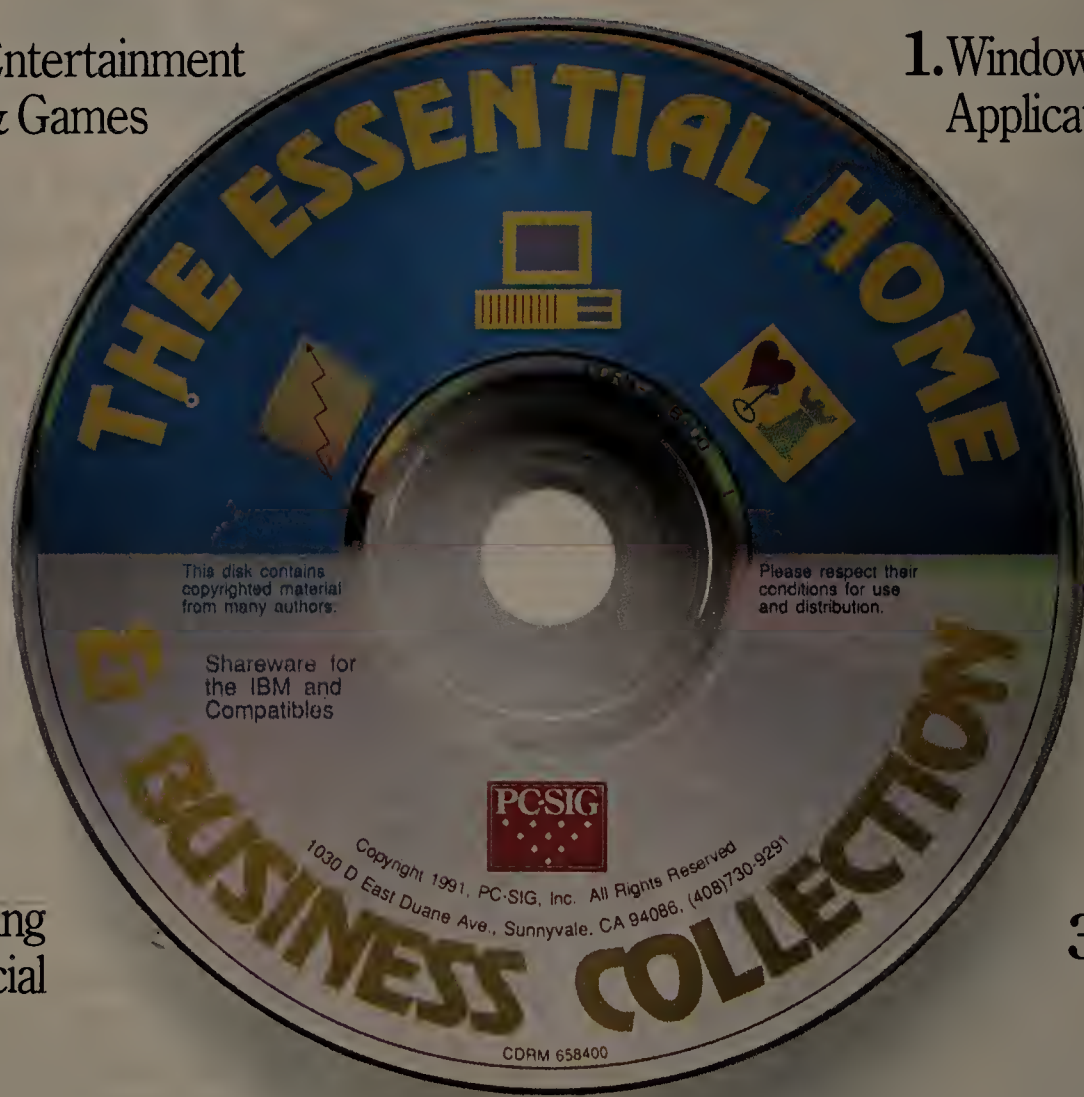

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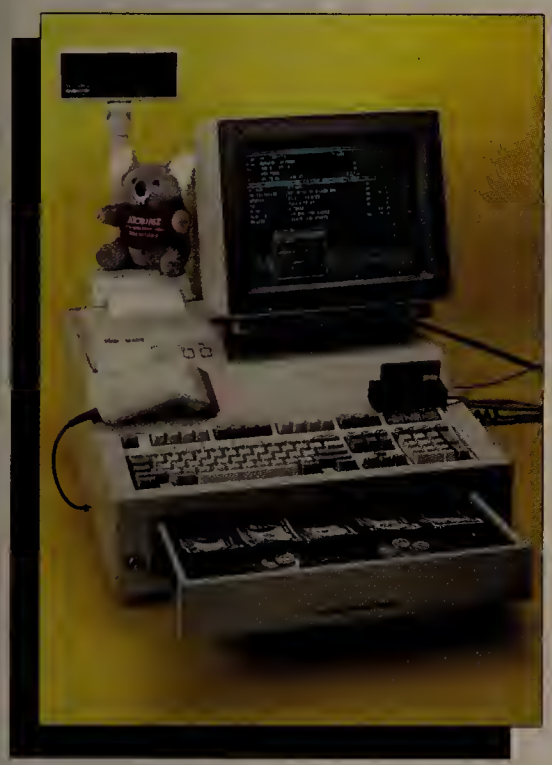

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Best of the Rest

Coming Soon to a Desktop Near You

Norton Desktop and *NewWave* were the first full-featured *Windows 3.1* shells on the market, but that doesn't mean they're the best, or that they can rest on their laurels. All of these programs work with *Windows 3.0* and *3.1*; compatible versions should be shipping by the time you read this. Here are some quick snapshots of these forthcoming shells, with likely version numbers noted.

AttiTools 2.0

AttiTools isn't an integrated shell but a loosely connected group of utilities. The key modules are *Dragnet*, a Boolean full-text search program; a *Windows*-like file manager that adds encryption and data compression; and a program launcher. Integration among the utilities is largely limited to passing results (such as file lists) via DDE.

Shells for the Rest of Us

● Yes
○ No
◒ Deficient

	AttiTools 1.01	HotWin 2.0a	PubTech File Organizer 3.1D	Salvation 1.1	SideBar 1.1	WinTools 1.0b
Standard features						
List price	$99.95	$99	$149.95	$69.95	$69.99	$149
RAM required (K)	260	156	50	200	160	120
Hard disk space required	1MB	330K	1.6MB	1MB	200K	1.3MB
Selective install/uninstall	○	○	○	○	○	○
Uninstall option	○	○[1]	○[1]	○	●	●
On-line help	●	○	●	●	○	●
On-line tutorial	○	○	○	○	○	●
Compatibility						
Windows 3.1	●	●	●	●	●	●
Windows 3.0	●	●	●	●	●	●
Runs in real mode (Windows 3.0)	○	○	●	○	○	●
Applicotion shortcut keys	◒	●	○	○	●	○
Start-up group	●	●	○	●	○	●
Working directory	●	●	○	○	●	●
Drag-and-drap	○	○	●	○	●	●
Mouse retained by windawed DOS application	●	○	○	○	●	○
DDE support	●	○	○	●	●	●
OLE support	○	○	○	○	●	○
TrueType support	○	○	●	○	○	●
Multimedia Extensions	○	○	○	○	○	●
Supported networks						
Banyan's VINES	●	●	●	●	●	●
LAN Manager 2.1 ond later versions	●	●	●	●	●	●
NetWare 2.15 and loter versions	●	●	●	●	●	●
Program management						
Reploces Program Manager	○	○	●	●	●	●
Replaces Task List	○	●	○	○	●	●
Nested groups/folders	○	○	●	○	○	●
View graups/folders as menu list	●	●	●	○	●	◒
Long group/folder names	●	●	○	○	●	●
Runnable start-up groups	○	○	●	○	○	●
Customizoble button bar	◒	○	○	◒	○	●
View opplicotions os menu list	●	●	○	○	●	◒
Possword protect groups, icons, menus	◒	○	○	○	○	●
Customizable menus	○	●	◒	○	◒	○

With the release of *3.1*-compatible *AttiTools 2.0,* the file manager becomes a floating button bar that offers drag-and-drop file manipulation. One tool uses *Windows'* Object Packager to create compound documents that draw data from *Windows* and DOS files. You can also drop files found by *Dragnet* on file manager buttons for instant action.

HotWin 3.1

Like *AttiTools, HotWin* is a *Windows* sidekick. But it's mostly menu driven—which in some cases is a plus. Press the right mouse button, and up pops a handy customizable menu listing applications, groups, and files that you can run with a single click. You can also link just about anything to a hot key and even load another program while in a full-screen DOS application.

Another plus is *HotWin*'s "virtual desktop"—a tic-tac-toe graphical rendering of the Task List that lets you load programs into different work spaces and switch between them by clicking the appropriate pane. *HotWin*'s file manager, however, is even worse than *Windows',* and configuring menus means slogging through poorly organized dialog boxes.

The upcoming *HotWin 3.1* irons out wrinkles and adopts more *Windows 3.1* goodies—including more drag-and-drop operations. Need to locate an XLS file while in *Excel?* Run the file finder, and then drag the found file into *Excel* for instant loading. Configuring *HotWin* menus is also a drag-and-drop affair,

● Yes
○ No
◒ Deficient

	AttiTools 1.01	HotWin 2.0a	PubTech File Organizer 3.1D	Salvation 1.1	SideBar 1.1	WinTools 1.0b
Program management (continued)						
Custom nested menus	○	●	○	○	○	○
Save/restore desktop	○	●	●	○	○	◒
File management						
Replaces File Manager	●	◒	●	●	●	●
Drag-and-drop file copy/move	●	○	●	○	●	●
Drag-and-drop file loading	○	○	●	○	●	●
Drag-and-drop printing	○	○	◒ [2]	○	●	●
Drag-and-drop deletion	●	○	●	○	●	●
Drag data files onto desktop	○	○	●	○	○	●
Password protect files, directories	◒ [3]	○	○	●	○	◒ [4]
Lock out file/drive/network functions	◒	○	◒	○	○	●
Long file names	○	○	●	○	○	●
Open multiple drive windows	●	○	●	●	●	●
Customizable menus	○	●	○	○	○	○
File finder	●	●	●	●	○	●
Text search	●	○	●	○	○	○
Number of file viewers	16	none	none	4	none	2
Right mouse button support	●	●	○	●	●	●
Utilities						
Enhanced macro processor/language	○	○	○	○	○	◒ [5]
Batch language	○	○	○	○	○	○
Icon library	○	○	● [6]	● [7]	○	● [8]
Screen saver	○	●	● [9]	● [9]	○	●
Virtual desktop	○	●	○	○	○	●
Trash can	●	○	●	○	○	●
Unerase	●	○	●	●	○	●
File compression	●	○	○	○	○	○
Service and support						
Money-back guarantee	30 days	30 days [10]	30 days [11]	30 days	60 days	unlimited
Unlimited free support	●	●	●	●	●	●
Toll-free number	●	○	○	○	○	○
Daily support (hours)	10.5	8	8	9	11	10
On-line support	●	●	●	○	●	●
Fax support	●	●	●	●	●	●

[1] Manual lists files to remove.
[2] ASCII files only.
[3] Files only.
[4] Indirectly by restricting directory view.
[5] No keystroke recorder included.
[6] 160 icons.
[7] 318 icons.
[8] 200 icons.
[9] Will not blank full-screen DOS sessions.
[10] 20 percent restocking fee.
[11] Dealer sales only.

and you can create any number of hot keys for running programs or performing *HotWin* functions.

PubTech File Organizer 4.0

Long before *Norton Desktop* or even *Windows 3.0* existed, there was *PubTech File Organizer.* In 1989 when *Windows 2.*xx users were struggling with the MS-DOS Executive, *PubTech* offered a stunningly Macintosh-like, icon-driven, drag-and-drop environment for *Windows.* Double-click the drive icons on the *PubTech* desktop, and up popped a window filled with directory folders just like on the Mac. Double-click a data file in a folder, and the source application and file were loaded together. Drag a text file to the desktop printer icon, and voilà—the file was printed. Drag it to the on-screen trash can, and the file was purged. The program came with a passel of utilities, a desktop save command, and more. In short, *PubTech File Organizer* was years ahead of its time.

PubTech's Mac-like desktop offers goodies such as folders and drag-and-drop printing.

The current version, *3.1D,* offers all the above and more, but version 4.0 (due by the end of 1992) is a real leap forward. The word is *extensibility*—you'll be able to modify not only *PubTech*'s menus but those of *Windows* and *Windows* applications. Another neat trick will be *trays*—custom windows that can hold anything from print functions to drive icons to menu options. *PubTech* looks to be a strong alternative to both *Norton* and *WinTools.*

Salvation 2.0

Salvation's name may be a bit of hubris on Vitesse's part, but this low-cost shell does provide a fair amount for the money. You can create custom on-screen buttons that launch DOS and *Windows* programs; password protect subdirectories; add custom options to *Salvation*'s menus; undelete files; call on screen blankers and alarms; and more. *Salvation* more or less integrates program and file management. The main screen shows buttons that load programs, a minimal directory/file list, and a few buttons for switching quickly to the DOS prompt or Program Manager, exiting *Windows,* and so on. But to do real file management, you must bypass the desktop for a separate menu option that opens dual directory windows.

Salvation's desktop holds program buttons, a file manager, and other one-click options.

With version 2.0, the program will fully exploit drag-and-drop functions for printing, moving/copying, and probably file viewing. File compression will be built into almost everything, so you can copy and compress files, run compressed files, and so on.

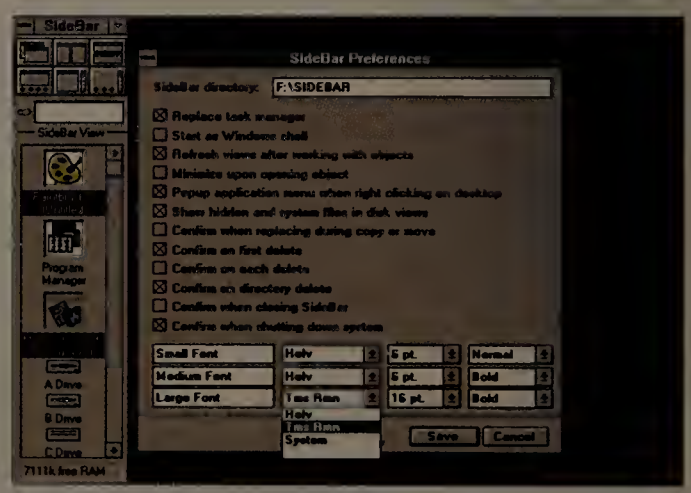
SideBar 2.0

Everything about *SideBar* shouts "less is more": This Gabby Hayes for *Windows* comes with a 40-page manual that's almost unnecessary. *SideBar* is simple and direct. As the name implies, it's a vertical box that holds key program and file management functions. You get a built-in DOS prompt, selectable drive and program icons, a simple directory tree and file list, and RAM and disk status. From *SideBar*'s single menu, you can dictate what options appear, run groups and programs off a one-click menu, control file associations, and dictate other *SideBar* settings. *SideBar 2.0* offers some cool *3.1* enhancements: You can drag files out of *SideBar* and embed them in any OLE-aware application, drop files on "smart objects" like a trash can or printer icon, create custom tool bars, and more. As *Windows* sidekicks go, *SideBar* could be a winner.

WinTools 1.1

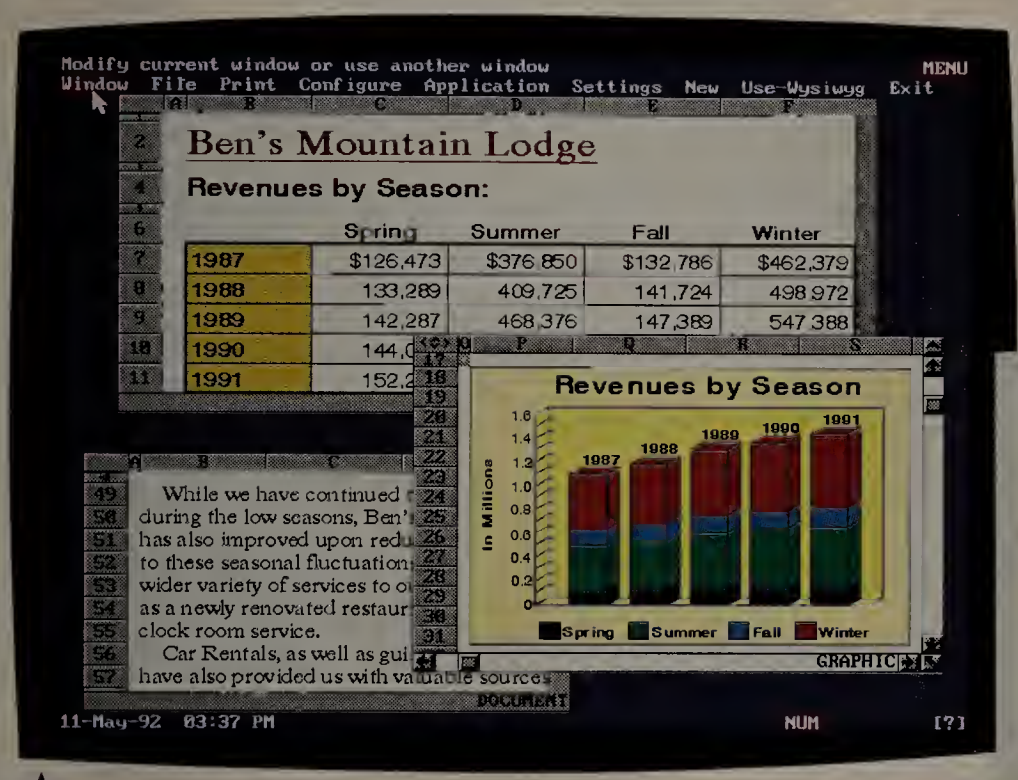
If you're hooked on menus, keyboard shortcuts, and other *Windows* aids, check out other shells. But if you want a taste of *Windows 4.0*—which promises to be a totally mouse-driven, object-oriented, drag-and-drop environment—*WinTools* is your baby.

WinTools' desktop holds a few groups and a sidebar that contains a *Norton*-like file manager, copy function, trash can, and other tools. Almost everything is done via drag-and-drop. To change a program's attributes, you drop its icon



SideBar packs window arrangement icons, a DOS prompt, and program and drive icons.

Unlike most symphonies, this one needs to be seen to be appreciated.



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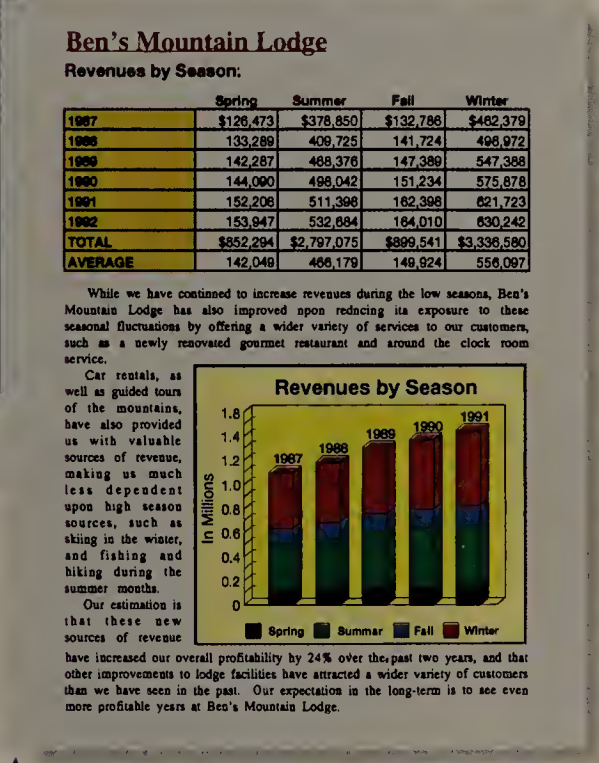

Ben's Mountain Lodge

Revenues by Season:

	Spring	Summer	Fall	Winter
1987	$126,473	$378,850	$132,786	$462,379
1988	133,289	409,725	141,724	498,972
1989	142,287	468,376	147,389	547,388
1990	144,090	498,042	151,234	575,878
1991	152,206	511,398	162,398	621,723
1992	153,947	532,684	164,010	630,242
TOTAL	$852,294	$2,797,075	$899,541	$3,336,580
AVERAGE	142,049	466,179	149,924	556,097

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Symphony Release 3. Sounds good, doesn't it?

Lotus Symphony

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on the Size tool and fill in a dialog box. To create a nested group, you drop the parent group's icon on the copy tool and then configure the generated child group. To manage programs, you send the Task List packing and use a graphical virtual desktop instead. You can even create custom button bars for applications that lack them.

It's a flexible environment and a step ahead of Microsoft, so the upcoming 1.1 version won't need to add much in the way of *Windows 3.1* functionality. In fact, *WinTools 1.1* will add back doors for old *Windows* and DOS hands: more keyboard support (including shortcuts), an <F1> help key, plus more help all the way around and more sample tool bars to get you started on customizing the *WinTools* environment.

For more information about all products in this article, circle reader service no. 905.

WHERE TO BUY

AttiTools 1.01
Attitash Software Inc.
20 Trafalgar Sq.
Nashua, NH 03063
800/736-4198, 603/882-4809, 603/882-4936 (fax)
LIST PRICE: $99.95
Reader service no. 651

HotWin 2.0a
Abacist Software Co.
5580 La Jolla Blvd. #340
La Jolla, CA 92037
800/729-3597, 619/488-3929, 619/483-9713 (fax)
LIST PRICE: $99, upgrade $20
Reader service no. 652

NewWave 4.0
Hewlett-Packard Co.
974 E. Arques Ave.
Sunnyvale, CA 94086
800/554-1305, 408/720-3560 (fax)
LIST PRICE: $195, upgrade $49
Reader service no. 653

The Norton Desktop 2.0 for Windows
Symantec Corp.
10201 Torre Ave.
Cupertino, CA 95014
800/441-7234, 408/253-9600, 408/255-3344 (fax)
LIST PRICE: $179, upgrade $49
Reader service no. 654

PubTech File Organizer 3.1D
Publishing Technologies, Inc.
500 Capital of Texas Hwy. N, Bldg. 8
Austin, TX 78746
512/328-2483, 512/329-5642 (fax)
LIST PRICE: $149.95; upgrade $20 (disk only), $40 (disk and manual)
Reader service no. 655

Salvation 1.1
Vitesse, Inc.
P.O. Box 929
La Puente, CA 91747-0929
800/777-7344, 818/813-1270, 818/813-1273 (fax)
LIST PRICE: $69.95, upgrade from 1.0 $10
Reader service no. 656

SideBar 1.1
Paper Software, Inc.
467 Rte. 208
New Paltz, NY 12561
914/255-0056, 914/255-7572 (fax)
LIST PRICE: $39.99
Reader service no. 657

WinTools 1.0b
Tool Technology Publishing
1125 A St. #107
San Rafael, CA 94901
415/459-3700, 415/459-1079 (fax)
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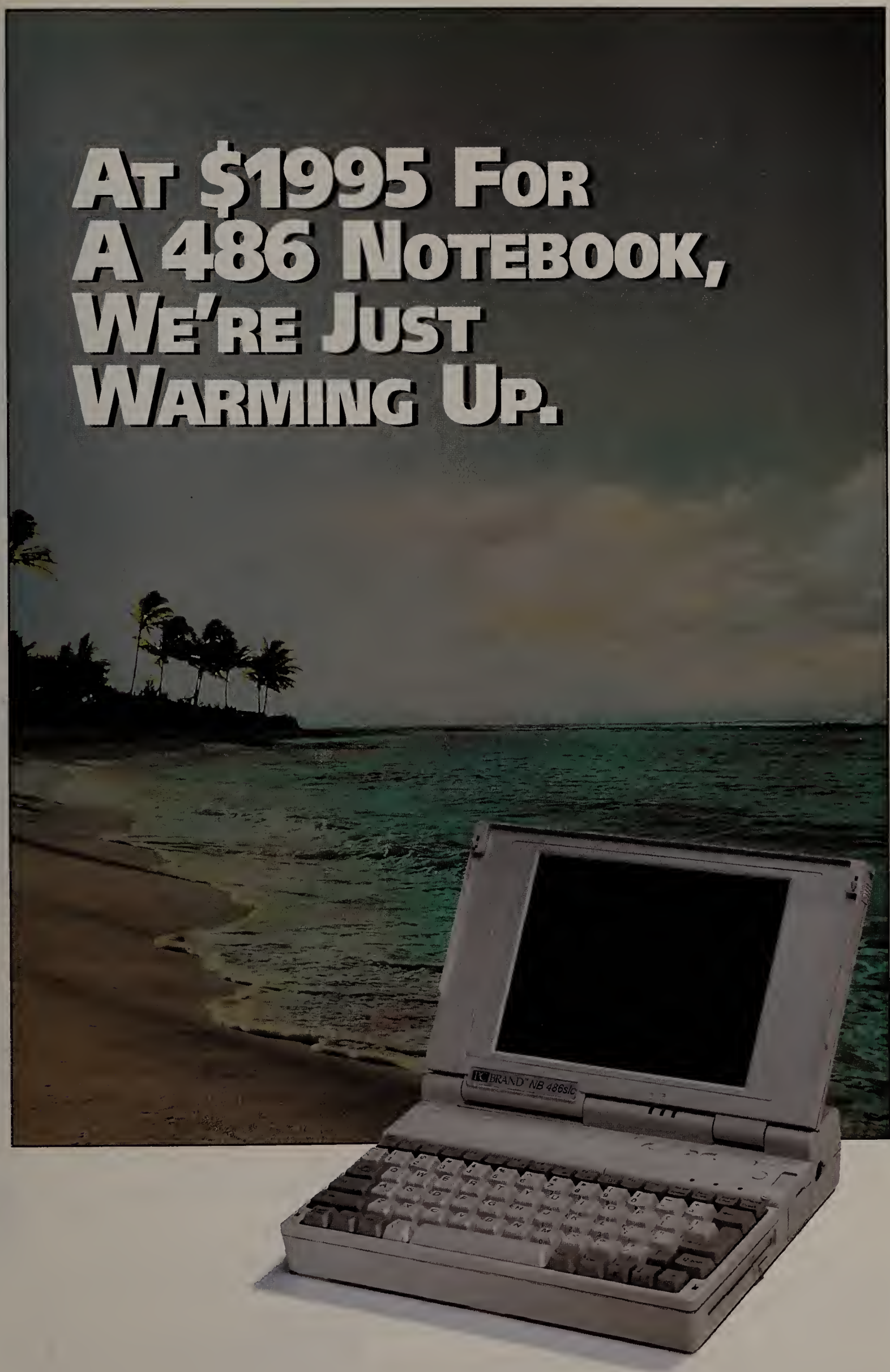
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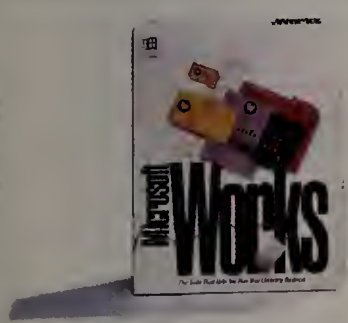

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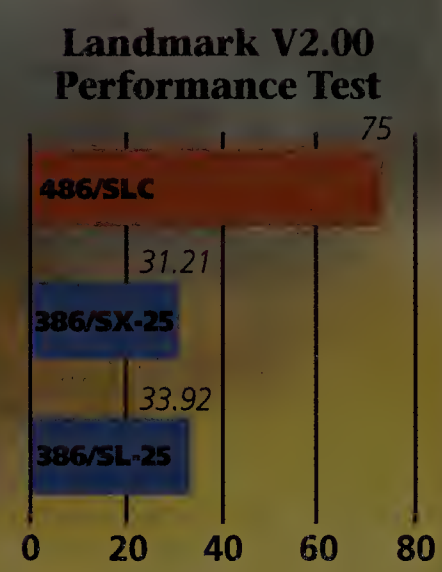

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WINDOWS THE WAY YOU WANT IT

THIRTY LOW-COST UTILITIES TO TRANSFORM YOUR WINDOWS ENVIRONMENT INTO A HOME AWAY FROM HOME. BY DANIEL TYNAN

TOM CUSHWA

NOBODY EVER CLAIMED that *Windows* was perfect. In fact, Microsoft's graphical interface has succeeded in spawning an entire cottage industry of enhancement products that strive to make *Windows* a nicer place to live.

If you're an ambitious *Windows* remodeler, you can install a shell such as *Norton Desktop* or *NewWave* (see "The Windows Shell Game") and never have to look at *Windows'* Program Manager or File Manager again. If you're interested in more selective changes—editing your icons, programming your mouse, or replacing *Windows'* clumsy File Manager, Task List, or Program Manager, for example—you can take your pick from among the 30 utilities described here.

These programs, all compatible with *Windows 3.1*, are some of our favorites. They're available commercially (see "Buyers' Guide: Windows Shareware" in August for more low-cost utilities) and cost $150 or less—most much less. While we've attempted to group programs by category, overlap is unavoidable: It's hard, for instance, to find a program launcher that doesn't offer some file management, or a file manager that won't let you start applications. Think of it as getting a bonus.

Of course, how you like your interface is a matter of taste, and not all these utilities will be right for you. But if a category heading intrigues you, check it out. There's sure to be something here to make *Windows* feel a bit more like home.

CURSOR AND ICON TOOLS

Anyone who's lugged a laptop is familiar with the Case of the Disappearing Cursor. And if you've ever stalked your favorite DOS app through a forest of generic program icons, you know the limits of *3.1*'s icon library. These utilities offer cursors and icons that stand out on the dimmest notebook screen or most crowded desktop—as well as tools to edit, manage, and replace them.

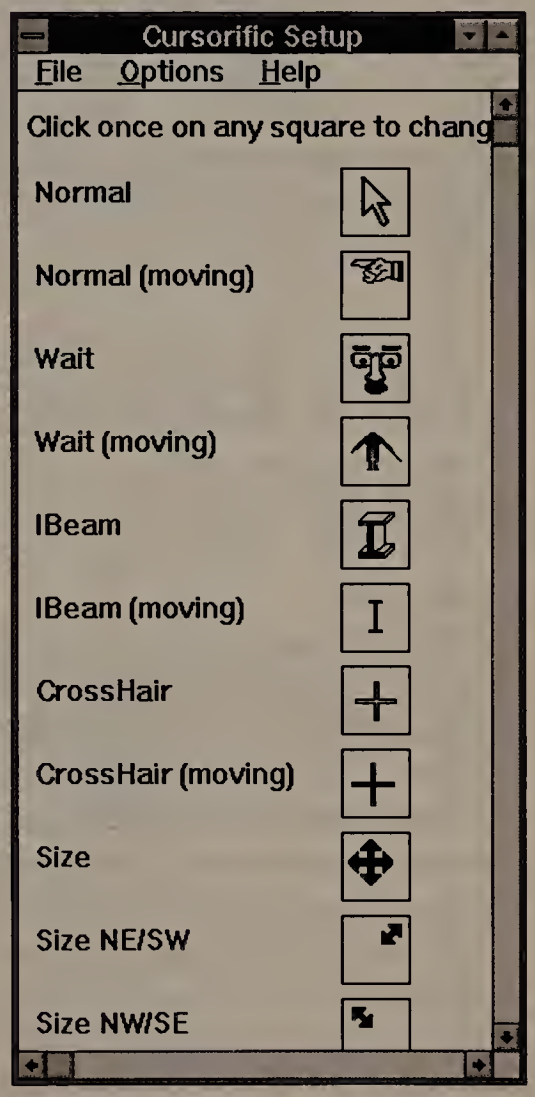
Cursorific Professional 2.0

Windows' standard pointer, hourglass, I-beam, and other cursors give new meaning to the word *boring. Cursorific* can enliven your desktop with a clever black-and-white replacement cursor. Choices range from a quiver of arrows to rockets, elephants, and famous personalities, including animation: Watch a clock dial spin or Groucho's eyes roll as you wait for *Excel* to load. AApex Software Corp.; 800/728-7650, 702/324-4580, 702/324-4578 (fax). List price: $69.95.

Reader service no. 610

Magic Cursor II

If you're tired of playing "now you see it, now you don't" with your cursor, *Magic Cursor* has a few tricks to show you. You can enlarge the cursor with a click of a button, choose movable cross hairs that extend the length and width of the screen, or have the cursor leave a trail of shadow images as it glides across your applications. A hot-key combo



Cursorific gives you hundreds of replacements for Windows' small set of cursors, including animated ones.

turns your cursor into a magnifying glass, doubling the size of text beneath it. Pick from a library of nearly 300 cursors, or customize your own with *MC*'s editor. Fanfare Software; 818/886-8787 818/886-2250 (fax). List price: $49.95.

Reader service no. 611

hDC Icon Designer 2.0

Looking to create icons with a personal touch? *Icon Designer 2.0* lets you edit and combine existing icons, capture icon-size bits of screen, or create your own images from scratch. The program provides a modest library of icons; you can also import and modify icons from *Windows* EXE and DLL files. hDC Computer Corp.; 206/885-5550, 206/881-9770 (fax). List price: $59.95.

Reader service no. 612

hDC Icon Designer is loaded with colorful images that you can blow up, edit, and combine with others.

Icon Do-It 1.07
Icon Tamer Professional 2.07

Customizing your desktop doesn't get any easier than with *Icon Do-It*. Just highlight the icon you want to replace, and choose from a gallery of 200 program icons and 50 cursors. You can also pull icons from *Windows* ICO files or use one of *Do-It*'s 17 animated images. An animated screen saver turns your idle cursor into a bird, spider, or tornado churning across your desktop. True icon worshippers should consider *Icon Tamer Professional*, which provides more than 1000 images, as well as icon editor and screen capture utilities. Moon Valley Software; 602/375-9502, 602/993-4950 (fax). List price: *Icon Do-It* $29.95, *Icon Tamer Professional* $69.95.

Reader service no. 613

IconLink 2.0

IconLink automatically rounds up every icon on your hard disk—including those in EXE and DLL files—and herds them into manageable groups. To replace an existing program icon, open a group window and drop the new icon on top of the old one. You can drag icons between groups and save individual images as ICO files for use with an icon editor. PC Windows; 800/488-5332, 818/991-5332. List price: $29.95.

Reader service no. 614

DESKTOP EXTENDERS

Run multiple programs under *Windows*, and your screen fills up like a subway at rush hour. Pretty soon you're stuck mousing around between half a dozen overlapping windows or constantly <Alt>-<Tab>-ing to get to the app you want. Before you spring for a 20-inch monitor, take a look at one of these programs. They'll help you organize your work space or at least make your screen seem bigger than it really is.

More Windows 3.0

With *Windows*, the more screen you get, the better—especially when you're viewing big spreadsheets or running applications side by side. *More Windows* won't make your monitor bigger, but it can make getting to distant screen real estate a lot quicker. While *More Windows* draws what looks like a normal 640 by 480 display, it actually creates a "virtual" screen in RAM up to 66 percent larger. To access the hidden parts of your screen, drag your mouse to the edge—the screen pans along with it, much faster than using *Windows*' scroll bars. Aristosoft Inc.; 800/338-2629, 800/426-8288 (California), 510/426-5355. List price: $99.

Reader service no. 615

Rooms

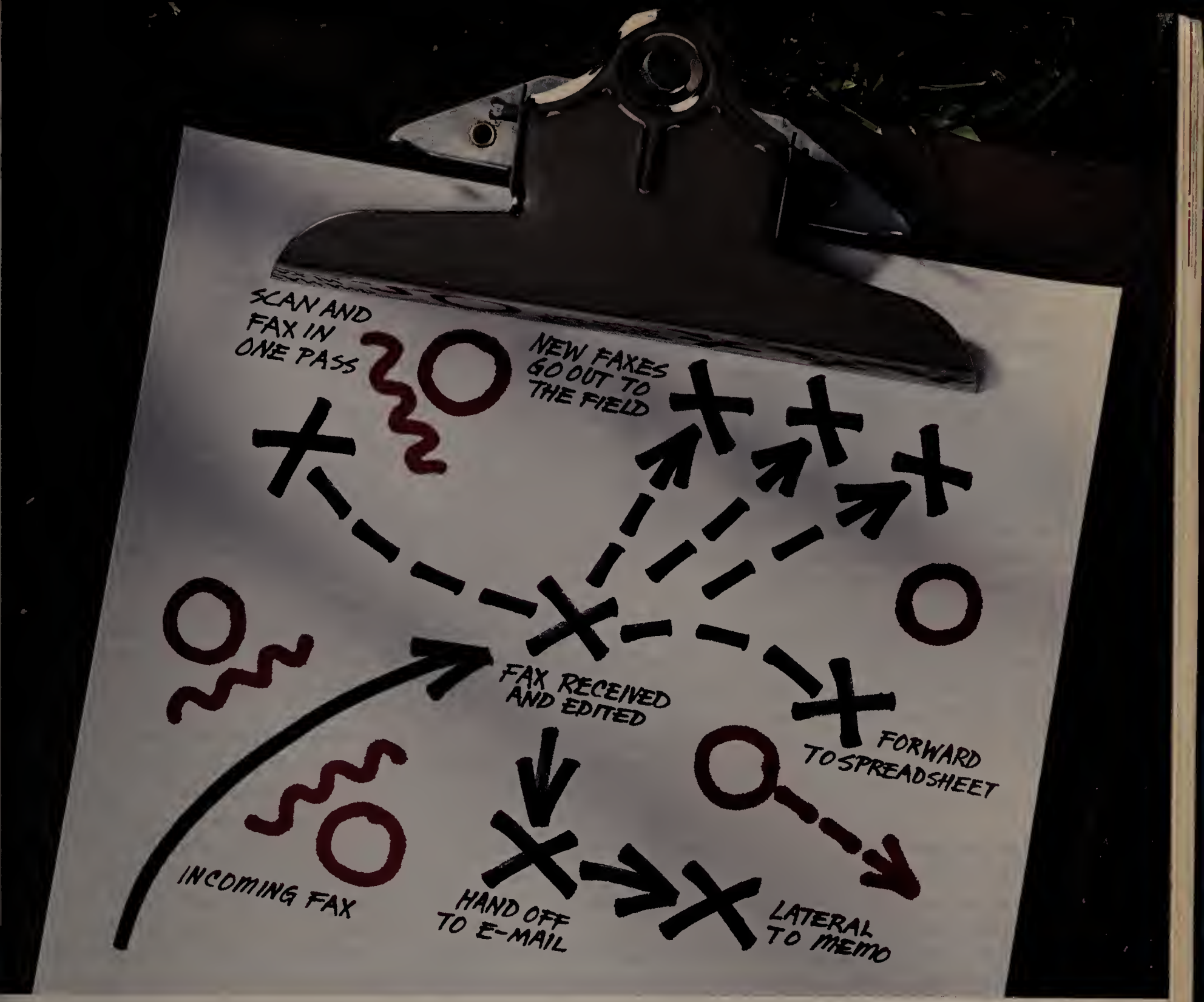
If you believe there's no place like home, *Rooms* should make you happy, because it makes running multiple apps a lot homier. Here you create a suite of virtual desktops, or rooms, and furnish them with applications. Run Program Manager in one room, *1-2-3 for Windows* in another, and *WordPerfect* in a third, then slip easily between them via "doors." You can have *Rooms* load all your apps at start-up and create buttons with descriptive names for quick file loading. A handsome overview lets you survey the floor plan and drag objects from one room to another. Xerox Corp.; 800/626-6775. List price: $99.

Reader service no. 616

WideAngle 2.0

Like *Rooms*, *WideAngle* lets you manage your applications in virtual desktops, except that *WideAngle* calls them work spaces. You can create groups of nine work spaces apiece and have applications load and unload as you move between them, conserving system re-

Editing one of Icon Tamer's more than 1000 icons is monstrously easy.



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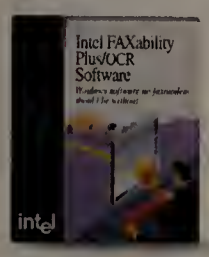

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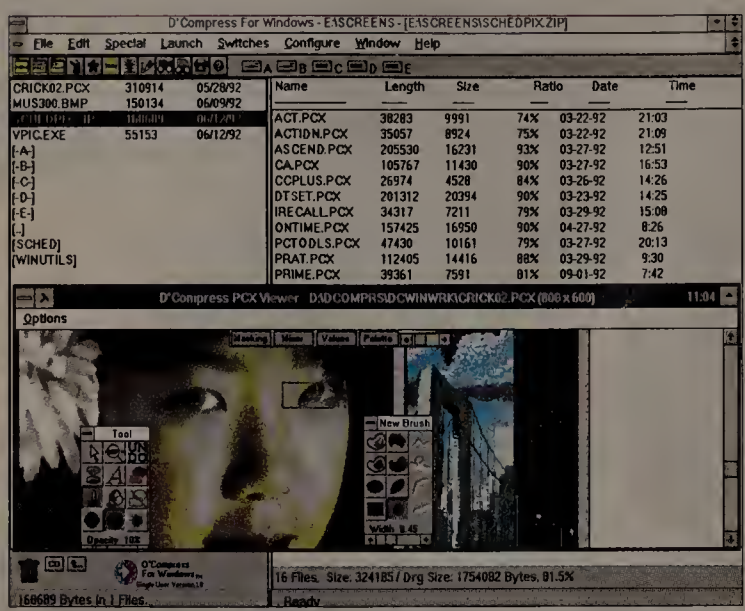


D'Compress lets you view the contents of files within ZIP archives, such as this PCX graphic.

sources. A unique X-ray view displays the outlines of every window in a work space—ideal for finding small windows hidden behind larger ones. Attitash Software Inc.; 603/882-4809, 603/882-4936 (fax). List price: $99.95.

Reader service no. 617

FILE MANAGERS AND VIEWERS

Windows 3.1's File Manager is a world of improvement over *3.0*'s, but there are still continents left to conquer. The following utilities cover much of the territory Microsoft left unexplored. Some are File Manager replacements that combine drag-and-drop file manipulation with easy-access command icons; others are single-purpose add-ons that provide the powerful searching, viewing, printing, or compression capabilities that File Manager lacks.

D'Compress 1.0

Is your hard disk overgrown with *Windows* files? Let *D'Compress* help clear a swath. This ultimate compression utility lets you select files with the mouse and instantly create ARC, ARJ, ZIP, or other compressed file formats. You can view text and graphics files within archives and scan disks for viruses. An icon-rich interface features binoculars for viewing files and a trash can for deletions. Moon Valley Software; 602/375-9502. List price: $99.95.

Reader service no. 618

File Shuttle Xpress 5.1

File Shuttle's claim to fame is its ability to shuffle files between your desktop and laptop—you can transfer the contents of an entire drive in the background. But *Xpress* also has cool file management tools: You can drag files between two drive windows or delete by dropping them on a shredder icon. You can also print files and launch applications from a custom menu. GetC Software Inc.; 800/663-8066, 604/684-4772 (fax). List price: $139.95.

Reader service no. 619

hDC FileApps 1.0

FileApps augments *3.1*'s File Manager with a colorful stacked bar chart of your directories. Move a magnifying glass along the chart to peer inside files, delete them, and launch executable programs. A capable search module fetches files by content and displays text strings, while a file share utility lets you hook up a laptop and treat it like another hard disk. hDC Computer Corp.; 206/885-5550, 206/881-9770 (fax). List price: $129.95.

Reader service no. 620

Outside In 1.0

Outside In gives you the inside skinny on your files. Select a file from *OI*'s scrollable list or grab it from *Windows'* File Manager, and the file pops up on the view screen. From there you click on icons to print, copy data to the Clipboard, or launch the app with the file loaded. *Outside In* also sports strong text- and file-search tools and supports more than 90 text and spreadsheet formats; filters for PCX, BMP, and other graphics files are due in the fall. Systems Compatibility Corp.; 800/333-1395, 312/329-0700. List price $89.

Reader service no. 621

Searcher Professional 1.1

If you need to hunt down a file in a hurry, seek out *Searcher Professional.* This file finder lets you specify multiple file extensions, as well as date, size, and content. It can search text for complex strings (such as first and last name) and display a list of found files followed by the lines where the text appeared. You can even assign icons to data files and launch them—and their associated apps—from Program Manager. Cognitronix; 619/549-8955. List price: $59.95.

Reader service no. 622

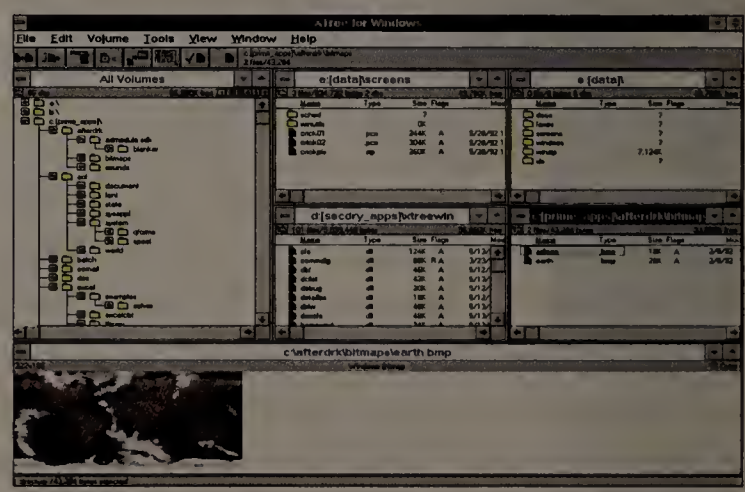
WindowsTools File Management

The star of this miniature library is a fast file finder that can hunt down files by content and show you where the specified text string appeared. *WindowsTools* also features a slick system information panel, a hexadecimal file editor, and a facility for copying files to multiple floppy drives. OXKO Corp.; 410/266-1671, 410/266-6572 (fax). List price: $98.

Reader service no. 623

XTree for Windows 1.0

This *Windows* version of the venerable DOS-based file manager has gotten a face-lift even Joan Rivers would be proud of. The sleek new interface features buttons across the top for copying,



XTree provides a bird's-eye view of all your drives and features viewers for BMP and other file formats.

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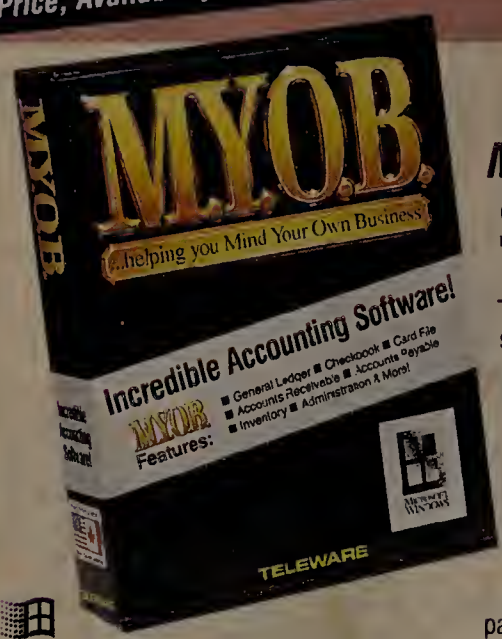

M.Y.O.B. 3.0

$138

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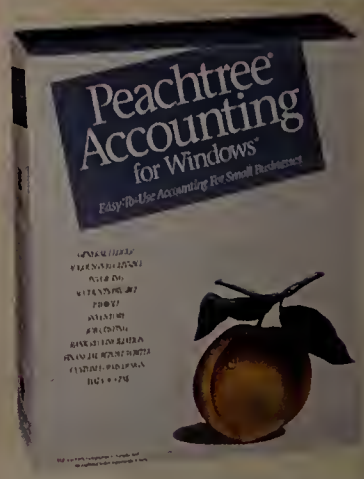
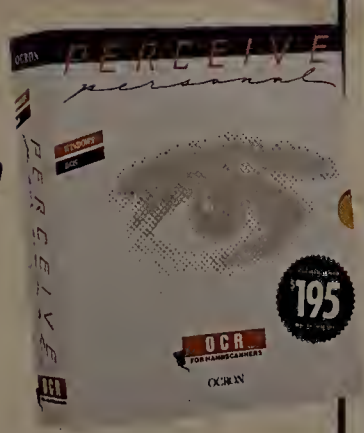


Peachtree Accounting

$74

Designed for use b small to medium-sized businesses, Peachtree Accounting for Windows offers a powerful accounting system that grows with your business. It supports cash-basis or accrual accounting, handles unlimited number of accounts and companies and maintains a complete audit trail for the year. It automatically checks for unbalanced entries and password protects your data. I addition to making accounting easy, it provides a general ledger, accounts receivable/payable, payroll, inventory, job costing, custom forms design, bank reconciliation and more. These features are incorporate with a multi-user and fully-networkable environment. Peachtree #11078

Scanner Software



Perceive Personal 2.0 OCR for Hand-Held Scanners

$118

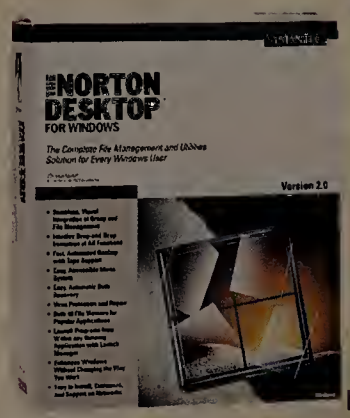
If you have a scanner, you know about the convenience of OCR. Now any hand-held scanner can have the powers of Optical Character serifs, with this inexpensive, yet powerful software. Your hand-held scanner will quickly recognize ligatured, underlined, bold, italic, proportionally-spaced and even dot-matrix characters with 99%+ accuracy. OCRON #10506

Preceive Desktop OCR #10507 ..... $178

Keep Your System Running Smoothly

Norton Desktop

$98



Norton Desktop for Windows makes using Windows easier and more convenient by providing an integrated environment with drag-and-drop support across the entire desktop. It includes backup, anti-virus scanning and correction, a Windows text editor, additional file viewers, a comprehensive batch language with macro capability, a network install program to make installation and maintenance easier for MIS administration, and many award-winning Norton data recovery and diagnostics tools. Symantec #07833 - 5.25" disk • #07834 - 3.5" disk

Symantec NDW Upgrade
• #10717 for 5.25" disk • #10718 for 3.5" disk $49

SuperStor 2.0 Data Compressio

$78

Running out of disk space can be frustrating. But with SuperStor 2.0, disk space becomes plentiful. This updated version makes it one c the fastest, most advanced data compression program software of its kind. Some of its new features include a Advanced Compression Utility Tool Kit that scans, checks and repairs data for optimal disk performance. SuperStor also has the highest compression ratio of any data compression software. Clear, colorful graphic displays make installing and using SuperStor simple as well. Runs with all popular operating systems and applications.
AddStor #07743

FAXGrabber

$104

FAXGrabber is the first fax conversion utility for Windows that automatically delivers incoming faxes into a form that can be read by your favorite word processing, spreadsheet or desktop publishing application. Using Calera's award-winning omnifont OCR technology, FAXGrabber converts fax images received from your PC fax card into text that can be edited, indexed or routed via E-mail. It processes fax transmissions in the background so you can simultaneously work on other things. FAXGrabber also compresses large fax files by converting fax images to text for quick printing and easy retrieval. It's all you need from a fax application.Calera #10509

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WordScan Plus

$455

Calera's WordScan Plus omnifont OCR software eliminates retyping by converting scanned or fax documents into almost any application. It features a preview window to see what you've scanned, special dictionaries and fax support to turn fax images into usable text. Its built-in dot-matrix recognition makes it easy to read draft quality documents, and the "Scan Now, Recognize Later" function lets you process stacks of documents in deferred mode. WordScan Plus includes features such as a Pop-Up Verifier™, clipping, style sheets and multi-job processing.
Calera #09806

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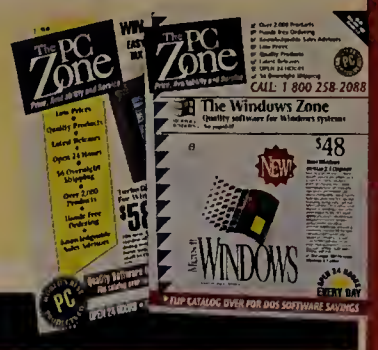
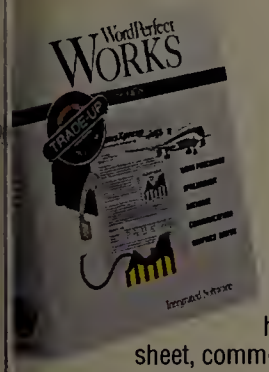


Back to School Software Savings

WordPerfect Works Competitive Upgrade $82



Finally, a Works package for DOS from the company you've come to trust in word processing. WordPerfect Works 1.0 starts off with the full functionality of LetterPerfect, including file compatibility with WordPerfect 5.1. It also has a powerful spreadsheet, communications software, a graphics editor and powerful database software that lets you easily organize important information in predefined formats or ones you design yourself. Each of these features is powerful on its own, and the combination is incredibly convenient.

WordPerfect #11128

WordPerfect Works Add'l Lic Pack #11127 ..... $58
WordPerfect Works 1.0 #07998 ..... $94

Intermission 2.0 $28

Intermission 2.0 is a unique collection of screen savers designed to protect your screen from damaging phosphor burn-in. The package features such colorful modules as Ant Farm, Battling Mixers, Fireworks, Flow, Dancing Pig, Bigfoot, Melting Screen, Flashlight, and Marine Screen II. There are even modules that will bounce your company logo around the screen, or place it in the face of a clock. Other modules permit you to program your own slide-show style presentations and more!

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Squeegee for Windows #11087 ..... $44

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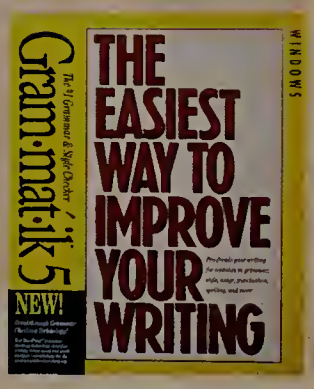

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Reference Software #08322

Grammatik 5 DOS #07699 ..... $58

Sportster 2400 Internal w/ Sierra Game Network $94

The Sportster 2400 modem and The Sierra Network on-line game software is all you need to open your PC to the world of interactive computer games. Challenge your skills in bridge, backgammon and a host of other games against other subscribers in real time. Any computer game player or on-line service user will have a blast with this package.

U.S. Robotics #11201

Sportster 2400 External w/ Sierra Game Network #11202 ..... $98
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7489	1MB*9 80ns Sip	$55
7816	4MB*9 80ns (qty 2)	$316

Where Power Is Shared: The LAN ZONE

One of the newest developments in information systems for power-using businesses is the installation of a Local Area Network, or LAN. Functioning much like a server, a LAN lets connected PCs access shared information. But a LAN has many advantages. It allows PCs to function as peers, able to use each others full functions from any unit on the connected system. Any PC accessing the LAN also has full use of all connected peripherals, as if it were connected to them directly . A Local Area Network can also be accessed from a remote PC not on the network; even one connected to another LAN in another city (via modem). The configurations of a LAN are almost limitless. And the benefits of sharing information in a peer-to-peer fashion will have you wondering how you ever did business without one.

Netware 3.11

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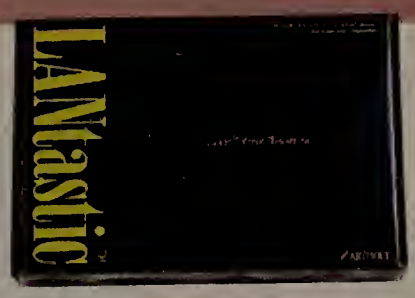

LANtastic Starter Kit AE-3 $624

Transform your IBM PCs, XTs, ATs or compatibles into a LANtastic network. Take advantage of LANtastic's small memory overhead—less than 12K on a node. Any user on the network can access any other user's data files. Load a program into one PC on the network and all the other PCs can use it. Attach a printer to a single PC in the network and everyone can print on it. The LANtastic package includes everything you need to get started: two AE3 Ethernet cards, cables and network software.

ArtiSoft #10806

Ethernet Starter Kit for Windows #11223 ..... $624
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Pocket Ethernet Adapter II

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Simplicity Starter Pack #10729 ..... $668

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moving, deleting, and viewing files. You can drag and drop files between directory windows, create new directories on the fly, even move directories from C: to D:. Built-in data compression lets you add or delete files from ZIP archives; a fast file viewer lets you look at more than 50 kinds of files in their native formats, even PCX and BMP graphics. XTree Co.; 805/541-0604, 805/541-4762 (fax). List price: $49.95 through October; $99 afterward.

Reader service no. 624

MOUSE AND KEYBOARD UTILITIES

Using a mouse can be a real drag. Just try to find room to use one on an airplane—or between your coffee mug and that stack of last week's mail. And with most *Windows* programs, one mouse button does all the work while the other sits there like a wooden leg. The following utilities let you program your mouse buttons, record macros, and run *Windows* via keyboard commands that make sense to you, not Microsoft.

K-U-I 1.0

Tired of rolling that mouse along your thigh on long flights? *K-U-I* gives you keyboard equivalents for your favorite mouse activities. Move the pointer using the cursor keys, and "click" by tapping <Insert>. *K-U-I* provides a task list crowded with hot-key combos, or you can create your own keystroke pairings to launch apps and jump between them. Softac Corp.; 800/433-0486, 617/721-1010. List price: $79.95.

Reader service no. 625

NoMouse 3.1

For notebook toters and other vermin haters, *NoMouse* is good mouse. Like *KUI*, this program lets you use cursor keys to move the pointer. But *NoMouse*'s controls are much simpler—one small dialog box lets you set cursor speed, define hot keys, and designate an anchor point for the cursor to return to. Abacus Inc.; 800/451-4319, 616/698-0325 (fax). List price: $49.95.

Reader service no. 626

ProKey for Windows 1.0

ProKey boils tedious procedures down to a mouse click. This macro processor stores your strokes and clicks in floating toolboxes that can be used in specific applications or systemwide. You can play back and edit each macro step by step. A unique feature lets you store Clipboard contents indefinitely in special "vaults." RoseSoft Inc.; 800/869-7676, 206/562-0225. List price: $99.

Reader service no. 627

Right On 1.7

Right On puts all your mouse buttons to work—even the middle one, if you've got it—letting you perform functions, run macros, and launch programs using mouse and keyboard combos. Hot-key templates let you customize settings for each application. Fanfare Software; 818/886-8787, 818/886-2250 (fax). List price: $49.95.

Reader service no. 628

Whiskers for Windows 2.0

Like *Right On*, *Whiskers* adds life to the your mouse. You can build different "mousetraps" for each app, assigning standard *Windows* actions (such as File Save), macros, pop-up menus, and launchers to mouse-*key* combos. But *Whiskers* is a hair more sophisticated, with finer controls over chording (pressing multiple mouse keys). genSoft Development Corp.; 206/562-1157, 206/562-0690 (fax). List price: $69.95.

Reader service no. 629

PROGRAM LAUNCHERS

Use *Windows* for a while and you'll swear the icons are breeding every time you look away from the screen. Even *Windows* veterans can get lost hunting for apps through a maze of program groups. These utilities let you organize and launch applications without tripping over the Program Manager. Many also provide simple task and file management, searching capabilities, and more.

Direct Access for Windows 1.0

The classic button-down interface for big corporations, *Direct Access* automatically turns program icons into a series of push-button menus. Extensive password protection allows multiple users to share one PC safely. *Direct* tracks application usage by user, client, and project—an easy way to bill computer time—and provides a Mac-like button for shutting down your system. Fifth Generation Systems Inc.; 800/873-4384, 504/291-7221. List price: $99.

Reader service no. 630

Easydos for Windows 3.0

Is your screen so jammed with icons you can no longer see straight? *Easydos* has the answer to icon overload. This simple text menuing system lets you organize descriptions of applications and data files into lists adjacent to single-letter buttons—to launch an app or load a data file, you just click its letter button. *Easydos* provides room for 240 entries, with descriptions up to 20 characters long. MicroSeconds Int'l, Inc.; 619/756-0765, 619/756-0855 (fax). List price: $49.95.

Reader service no. 631

Metz Task Manager 2.0

Metz takes *Windows* to task, replacing the bare-bones task manager with scrol-

Program Manager suffering from icon gridlock? EasyDOS keeps desktop traffic flowing smoothly, with simple text menus for applications and data files.

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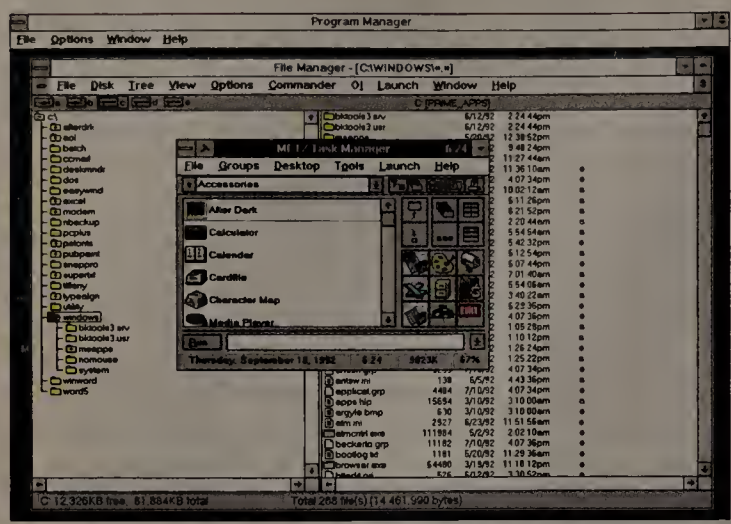


Metz offers an icon-based program list, file management utilities, and a nine-button launchpad.

lable lists of program groups and icons. A customizable nine-button launchpad gives you instant access to vital apps. *Metz* also features a small but tidy file manager, a command line, and fast file- and text-search modules. Metz Software; 800/447-1712, 206/641-4525. List price: $49.95.

Reader service no. 632

Squeegee 1.0

Squeegee makes a messy desktop squeaky clean. The program icon installs in the title bar of each *Windows* program; a single click pops up a text menu of your program groups, making it easy to launch one app from inside another. You also get a task list, dual-window file manager, and content-based file finder. Icom Simulations, Inc.; 800/877-4266, 708/520-4440. List price: $79.95.

Reader service no. 633

UTILITIES LIBRARIES

If you hunger for a single-box solution for your *Windows* woes, check out a utility library. Standard components for these packages vary, but you'll usually find a way to launch programs, manage files, and scope out your system resources. Many offer extras such as disk optimizers, customizable tool bars, and macro processors.

Amish Utilities for Windows 1.0

There's certainly nothing old world about *Amish Utilities*. These six little programs enable you to build a pop-up launch menu, create as many as 64 virtual screens, and set alarms to pop up reminders or schedule program launches. *Amish* also provides a rudimentary file manager and memo pad. Amish Software Inc.; 415/323-4627, 415/323-0138 (fax). List price: $99.

Reader service no. 634

Becker Tools 3.0

Becker combines a capable file manager with tools for fixing slipped disks. The dual-window shell offers all the file management amenities, including searching, viewing, and printing. A customizable 12-button toolbox opens the door to the rest of this library's talents, which include disk backup, optimization, formatting, compression, and file recovery. Abacus Inc.; 800/451-4319, 616/698-0325 (fax). List price: $129.95.

Reader service no. 635

hDC Power Launcher 2.0

With so many modules, hDC's utility library is no free launch. A tool bar along the top of your screen lets you run enhanced DOS commands, scan system resources, manage a virtual desktop, build launch menus, assign macros to mouse buttons, and more. You can create custom tool bars for each application, schedule program launches and set alarms, and embed OLE objects within documents. You can even drag files from *Windows'* File Manager and drop them on a printer icon for instant hard copy or on a trash can icon for deletion. hDC Computer Corp.; 206/885-5550, 206/881-9770 (fax). List price: $99.95.

Reader service no. 636

Synergy 1.0

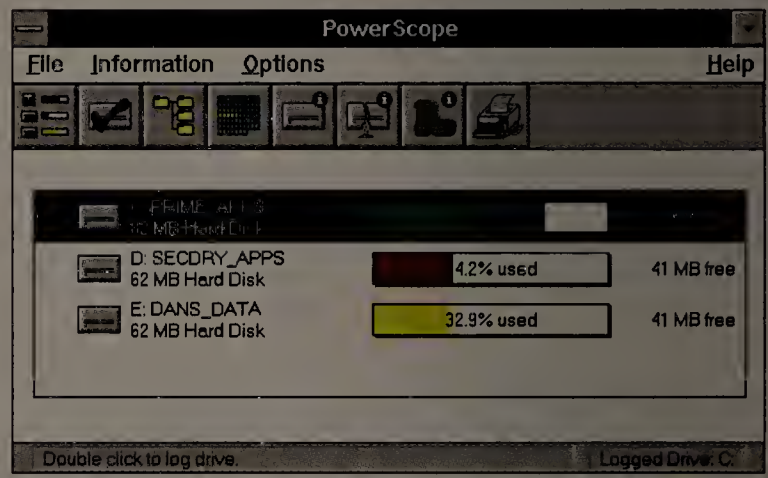
This squad of nine utilities comes with a full macro script language and debugger for creating your own programs. You also get prefab tool bars for popular *Windows* apps—even *WordPerfect* and *1-2-3*—as well as the capability to set alarms, schedule application launches, and retrieve files. *Synergy* also includes an icon editor, screen capture utility, and library of sound effects you can attach to different *Windows* functions. SynApps Software, Inc.; 206/562-3015, 206/643-4218 (fax). List price: $129.95.

Reader service no. 637

WinMaster

A collection of powerful, easy-to-learn programs, *WinMaster* comes with a floating four-button toolbox that you can customize by adding buttons with prefab commands (such as copy and rename). You can create new toolboxes and link one toolbox to another with a button. Snazzy diagnostic tools map your disk clusters and help you schedule defragging operations, which *WinMaster* will perform. You can also compress old files into easily extracted archives and view dynamic bar graphs that show you where all that RAM and disk space is going. PC-Kwik Corp.; 800/759-5945, 503/644-5644. List price: $129.95.

Reader service no. 638



WinMaster's powerful diagnostic utilities make it easy to scope out things like disk fragmentation, boot sectors, and hard disk space.

Daniel Tynan, a PC World *contributing editor, now sees icons in his sleep.*

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DOS SHELLS

BY DANIEL TYNAN

EVEN IF YOU USE WINDOWS, YOU HAVE TO FACE UP TO DOS OCCASIONALLY. OUR FAVORITE SOFTWARE PUNDIT PICKS TEN TOP SHELLS THAT MAKE LIFE WITH DOS EASIER, WHETHER YOU USE 5.0 OR AN EARLIER VERSION.

I hate DOS. Even after years of exposure, using commands like COPY, DIR, and DEL to manage my files leaves me vaguely nauseated.

That's why I use a DOS shell. This visual, menu-driven approach to hard disk management lets me locate and view files, copy or delete them, even run programs—without typing a single command. And unlike *Windows,* DOS shells don't require heavy-duty hardware to run effectively; an 8088 with 640K will do just fine. It's an idea so logical even Microsoft adopted it, including a limited shell interface in DOS 4.0 and a much better one in DOS 5.0.

Like most shells, DOS 5.0 provides a simple diagram of your hard disk directories called a *tree.* Select a directory branch, and a scrollable list of its files appears alongside. You can view the contents of two drives or directories at once, grab files with the mouse, and drag them from one directory to another. The shell also serves as command post for your applications. You can kick-start programs from a menu, an EXE or

ILLUSTRATION BY WAYNE VINCENT

COM file name in a directory listing, or most associated data files—for example, selecting a DOC file can launch your word processor with that file loaded. Unfortunately, DOS 5.0 still treats you like a child who shouldn't be handling sharp instruments. Take its directory management. You can't prune a directory branch from your C: drive and graft it onto D:. You can't make directories on the fly—you have to create and name a directory first before you can start moving files into it. Worst of all, when you want to get rid of a directory, you have to go in and delete all its files first.

If you need more powerful hard disk management, you'll want to consider one of the other shells listed in the accompanying table. This guide uncovers 33 shell programs that offer file management and more. I've taken them all for a spin around my hard disk and come up with my ten favorites, listed alphabetically on the following pages.

CRAWLING INSIDE A SHELL

You can't pick favorites without indulging some personal prejudices. Here are some of mine.

For me, ease of use is job one—if a shell is harder to use than DOS 5.0's shell, it had better have some powerful, redeeming features. I want to be able to copy or delete files immediately, without futzing with the manual or on-line

DOS Shells

						FILE MANAGEMENT			
Manufacturer	Product	List price	RAM required	RAM resident kernel size	Mouse support	Display multiple drives	Copy, move, delete full directories	Create directories on the fly	Move directories across drives
ALDRIDGE	Tree86 4.0 [1]	$89.95	212K	0–5K	Y	Y	Y	N	Y
BOURBAKI	Wander Plus/1dir+	$95	384K	8K	Y	Y	Y	Y	Y
BROWN BAG SOFTWARE	PowerMenu 6.0	$54.95	325K	3K	Y [2]	N	Y	Y	Y
	PowerMenu Plus 6.0 [3]	$99.95	325K	3K	Y [2]	N	Y	Y	Y
CANYON SOFTWARE	Hard Disk Director 5.0	$40	256K	2K	Y	N	Y	Y	Y
CENTRAL POINT SOFTWARE	PC Tools 7.1 PC Shell	$179	470K	13K	Y	Y	Y	N	Y
COMPUTER TYME	Deluxe DOS Toolbox 2.7	$99.95	384K	0K	N	N	Y [4]	Y	N
ECS SOFTWARE	Menu DOS 2.5	$49.95	88K	n/a	Y	N	Y [4]	Y	N
ELKAY SOFTWARE	AddtaDOS Plus	$49.95	140K	4K	Y [5]	N	Y	N	N
ELVISH CONSULTING	Elftree	$50	180K	0–2K	N	Y	Y	Y	Y
FIFTH GENERATION SYSTEMS	File Director	$129	256K	n/a	Y	Y	Y	Y	Y
FSDS	The Menu	$49.95	384K	n/a	Y	N	Y [6]	N	N
GAZELLE SYSTEMS	Q-DOS 3	$99.95	384K	3K	Y	Y	Y	N	Y
GETC SOFTWARE	File Shuttle Xpress 5.1	$139.95	110K	n/a	N	N	Y	Y	Y
LOTUS DEVELOPMENT	Magellan 2.0	$99	512K	n/a	Y	N	Y	Y	Y
MAGEE ENTERPRISES	Treeview 1.1	$25	256K	n/a	Y	Y	N	N	N
MEDIA MANAGEMENT SYSTEMS	SuperGUI	$99.95	512K	0–6K	Y	N	Y [4]	N	N
MICROSOFT	MS-DOS 5.0	$99.95	256K	2.3K	Y	Y	N	N	N
MICRO-Z	Direc-Tree AutoPilot	$79.50	42K	7K	Y	N	Y	N	N
M.R.E. SOFTWARE	Stereo Shell 4.0	$29.95	128K	n/a	Y	Y	N	N	Y
PC-SIG	DirectMaint	$29.95	256K	n/a	N	Y	N	N	Y
	iDCshell/NARC 4.0	$45	64K	n/a	Y	N	N	Y	Y
	Scaut-EM	$35	256K	5K	Y	N	N	N	N
	StupenDOS 3.0	$35	256K	4K	Y	Y	Y	N	Y
	TreeTop	$39	256K	n/a	Y	N	N	N	N
PS PUBLISHING	PS-Menu 1.5	$75	158K	0K	Y	N	Y	N	Y
RSE	PC-Directary 1.6	$39	33–80K	33K	Y	N	Y [8]	Y	N
SYMANTEC	Norton Desktop for DOS 1.0	$179	512K	5K	Y	Y	Y	Y	Y
	Norton Commander 3.0 [9]	$149	256K	13K	Y	Y	N	N	N
VEDIC	MCP 1.0 [1]	$179	512K	0K	Y	Y	Y	Y	Y
WESTLAKE DATA	PathMinder 4.11	$99	256K	4K	N	N	N	N	N
	PathMinder+ 1.02	$149	512K	4K	Y	Y	Y	Y	Y
XTREE	XTreeGold 2.5	$149	256K	7K	Y	Y	Y	Y	Y

[1] Not shipping at press time; scheduled to ship by publication date.
[2] Mouse drivers available via BBS.
[3] Includes file transfer and antivirus utilities.
[4] Delete only.
[5] From menu only.
[6] Copy and delete only.

help. I also like shells that show you two drives at a time and let you tag files, view them, and run programs with a few clicks of the mouse. And because I'm always installing and uninstalling software, I want to be able to copy, move, or kill off full directories with a single command—I was surprised to find out how many programs *don't* let you do that.

Next, I want a shell that launches my applications and gets out of the way—taking up as little RAM as possible. I prefer shells that launch programs from a menu: Hit a function key to pop up a list of apps, tap the *W*, and I'm in my word processor. Simple. A few shells build an application menu for you, though programs like *PowerMenu Plus* and *SuperGUI* give you password protection and other features that you need to create bulletproof front ends for novices.

I'm fond of mice and menus, but sometimes it's faster to use a DOS command. That's why I prefer shells that offer quick access to the prompt and let me copy file names and recently used commands to it.

Files are like house keys—I'm always forgetting where I put them. So I like shells that let me search all my drives and directories in one shot, especially those that search file content as well as file names and dates. Especially useful are programs that save my cri-

APPLICATION LAUNCHING			ACCESS TO DOS PROMPT			FILE SEARCHING AND LISTING										
From menu	From DOS prompt	From data file	On screen, shell in use	Copy file names to prompt	Stacks commonds	Across disk	Across directories ond bronches	By file nome exten-sion	By dote	By contents	Save search list criterio	Treot found files like directory	Number of file viewers	Compress files	View compressed files	Reoder service number
N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	3	N	N	800
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	3	N	N	801
Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	1	Y	Y	
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	1	Y	Y	
Y	N	N	N	N	N	Y	Y	Y	N	N	N	Y	14	N	Y	
Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	38	Y	N	802
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	Y	Y	
N	Y	N	N	N	Y	Y	N	Y	N	N	N	N	0	N	N	803
Y	Y	N	Y	N	N	Y	Y	Y	N	N	N	N	1	N	N	804
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	11	N	N	
Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	1	Y	Y	805
Y	N	N	N	N	N	Y	Y	N	N	N	N	N	0	N	N	806
Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	3	N	N	807
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	2	N	N	808
Y	N	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	40	Y	Y	809
N	N	Y	N	N	Y	N	Y	Y	Y	N	N	Y	2	N	N	
Y	Y	Y	Y	N	N	Y	Y	Y	N	N	N	Y	1	N	N	810
Y	Y	Y	N	N	Y	N	Y	Y	Y	N	N	Y	2	N	N	811
Y	Y	Y	Y	Y	N	Y	Y	Y	N	N[7]	Y	Y	8	N	Y	812
Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	N	2	Y	Y	
Y	Y	N	Y	N	N	N	N	N	N	N	N	N	2	N	N	
Y	Y	N	N	N	N	N	Y	Y	N	N	N	Y	4	Y	Y	
Y	N	N	N	N	N	N	Y	Y	N	Y	N	N	0	N	N	
Y	Y	Y	N	N	N	Y	Y	Y	Y	N	N	N	2	Y	Y	
Y	Y	N	N	N	N	N	Y	Y	N	N	N	N	2	N	N	
Y	Y	N	Y	Y	N	N	N	N	N	N	N	Y	3	N	N	813
N	Y	N	N	Y	N	Y	Y	Y	N	Y	N	N	2	N	N	
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	50	Y	Y	814
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	25	N	N	814
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2	N	N	815
Y	Y	Y	Y	N	Y[10]	Y	Y	Y	Y	N	Y	N	1	N	N	816
Y	Y	Y	Y	N	Y[10]	Y	Y	Y	Y	Y	Y	Y	8	N	N	816
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	52	Y	Y	817

[7] Can search contents of separate notes attached to files.
[8] Move only.
[9] At press time, Symantec was readying a new version; details were unavailable.
[10] Last command only.

teria so I can use them again and that display a directorylike list of found files that I can copy, delete, or move.

It's a lot easier to winnow a list of files if you can see what's inside them. Without requiring you to launch the application, file viewers let you look at files in their native formats instead of garbage-strewn ASCII or migraine-inducing hexadecimal code—the more formats you can view, the better. Just remember, you can't view graphics files if you don't have a graphics monitor. In fact, *Super-GUI, Norton Desktop for DOS,* and *XTreeGold* require one. Finally, I like shells that crunch down files to save disk space but still allow me to see what's inside them.

TO SHELL AND BACK

The variety and quality of DOS shells out there is amazing. I had a tough time picking my ten favorites, and in many cases I've broken my own rules. Some shells lack power but make up for it with a charming interface. Others are a drag to learn but offer features that will pay off in the long run.

Of course, you don't have to take my word for it. The other packages listed here—including DOS 5.0—may contain all the features you need. Whichever you choose, remember that the sole purpose of a DOS shell is to make your life easier. If it doesn't, it's just another useless piece of shellfware.

TYNAN'S TOP TEN

FILE DIRECTOR

Fifth Generation Systems

At first glance, *File Director* looks a little lame. For example, when you copy files, the source directory always has to be in the left window, the destination in the right. But this program packs a lot of power in its pulldown menus. You can prune and graft directories between drives and wipe disks clean with a single command. Need to know which files you've deleted or moved? *File Director* logs all disk activities. It has perhaps the best balance of simplicity and strength.

HARD DISK DIRECTOR 5.0

Canyon Software

✓SHAREWARE When I hear "shareware" I think: underpowered. But *Hard Disk Director* changed my mind. It's quick, easy, and strong. Mousing around the tree is a breeze. Tap the left mouse button to tag files, the right to view them. You can copy directories across drives with just a few clicks—no need to type path names. For $40 you can't do better. Available as HDD50.ZIP on PC World Online and other on-line services.

MAGELLAN 2.0

Lotus Development

Let's be honest: Navigating with *Magellan* is no pleasure cruise. You'll have to plunge into the manual to figure out such basics as how to copy files. I picked it for one reason: its powerful file search tools. *Magellan* searches files using Boolean operators and fuzzy-text matches—a search for *phone* can turn up files containing *phones* and *phoned*—and displays each file as you scroll down the directory. The bigger and messier your hard disk, the more you'll like *Magellan.*

NORTON DESKTOP FOR DOS 1.0

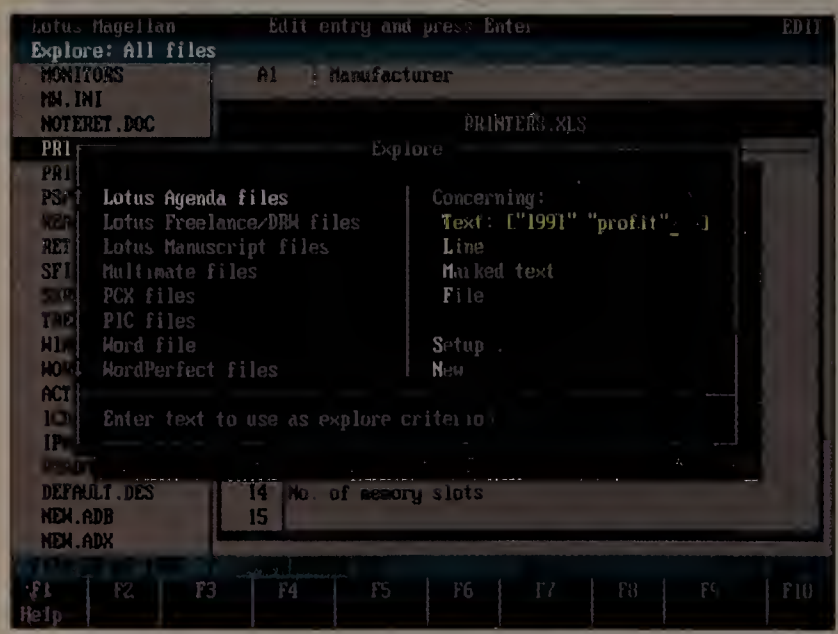
Symantec

I have seen the future of DOS computing, and it's graphical. *Norton Desktop for DOS* offers many of *Windows'* best features without all the Unrecoverable Application Errors. Click on disk icons to view the contents of each drive; to copy files, just drag them from their source directory and drop them on the target. I like *Desktop* because I'm lazy: It builds an application menu for me, schedules automatic backups, helps me recover lost files, and inoculates my disk against viruses. If I could just get it to write articles for me, I'd be a happy man.

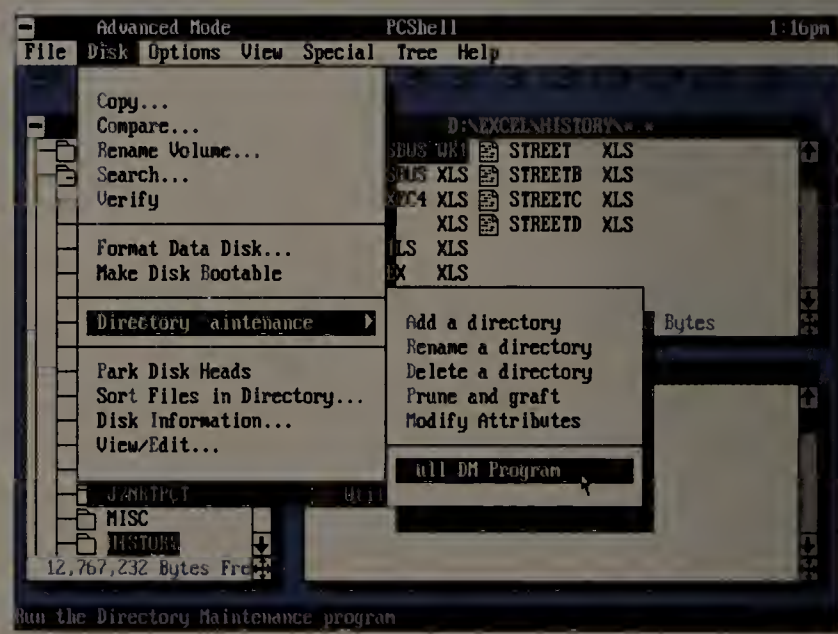
PC TOOLS 7.1 PC SHELL

Central Point Software

Buying *PC Tools* is like going to the all-you-can-eat software bar with your best friend Tubby. All you want is a shell, but



Magellan helps you explore your hard disk using a wide range of search criteria, then displays each file as you scroll down the list.



PC Tools' shell gives you lots of file management power, once you find the right menu.

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Circle 107 on reader service card

you come back loaded with backup, file recovery, and a half-dozen other utilities. The shell itself is tasty: Its graphical interface is far more customizable than DOS 5.0's, and you can launch apps with a macro loaded. But all that power makes it a little tough to chew. As part of a complete utilities solution, PC Shell is tops—but be prepared to mull over the manual.

POWERMENU PLUS 6.0

Brown Bag Software

✓SHAREWARE Most shells are file managers with wimpy application menus; *PowerMenu* is a meaty menu shell and more. I like its simplicity and versatility. Like *Norton Desktop,* it automatically builds the menu for you. The file manager offers easy access to essential functions, including a Hacksaw command that lops off full directories in one blow. A file transfer utility makes it easy to copy directories from one PC to another via cable or modem—a boon for laptop users. Available as PM60.ZIP on PC World Online and other on-line services.

Q-DOS 3

Gazelle Systems

Gazelle's *Q-DOS 3* may not be king of the DOS shell jungle, but it lopes gracefully across your hard disk. A customizable *1-2-3*–style menu bar and function key map put every command within easy reach. I like it because it lets me hunt for files across all drives—including huge network drives—and kill off loaded directories with a single bullet. A simple unerase function helps restore files when I'm too fast on the trigger.

SUPERGUI

Media Management Systems

SuperGUI is like *Windows* without the GUI mess. Instead of building a menu, this graphical front end creates icons that launch applications. Adding new programs is a snap, and you get a bit-map editor for customizing icons. And it's fun to use—how often can you say that about software? I wouldn't pick it for heavy-duty disk management, but it makes a friendly interface for novices who cringe at the sight of a DOS prompt.

Adding new programs to SuperGUI's graphical shell is fun: Just fill in a dialog box, click on the executable file, and choose an icon.

TREE86 4.0

Aldridge Company

Tree86 excels at playing hard disk detective. You can search each drive using up to four file specs or rummage each file for text strings, then play with a list of found files. *Tree86* has one of the handsomest pulldown menu interfaces I've seen; managing files and directories is quick and painless. While it lacks *Magellan*'s Boolean and fuzzy-text searches, for simple file sleuthing it's a snap.

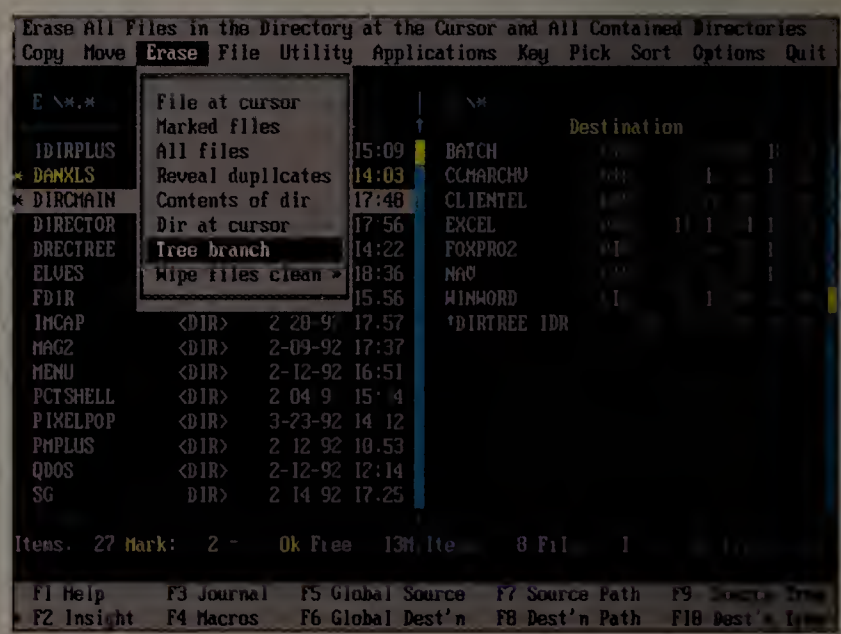
XTREEGOLD 2.5

XTree Company

XTree does just about everything. You can display files and directories in a variety of views, prune full directories, and create new ones on the fly. Its 13 graphics viewers make it a lot easier to sift through disk-hogging image files. *XTree*'s complicated interface may leave first-time users out on a limb, but this giant redwood of DOS shells is simply too powerful to ignore.

Contributing Editor Daniel Tynan lives inside a DOS shell in San Francisco.

Having second thoughts about deleting those files? Q-DOS's unerase command lets you recover files with a couple of keystrokes.



The powerhouse XTree gives you 52 ways to view files in their native format—including graphics like this AutoCAD DXF file.

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"It's extremely easy to learn and use. With just the little bit of Windows experience I have, I got through without touching the manual."– John J. Kalamarides, Greenwich Associates. The 100% Windows interface makes doing analysis simple. Hypertext help and an on-line glossary of statistical terms are just a click away.

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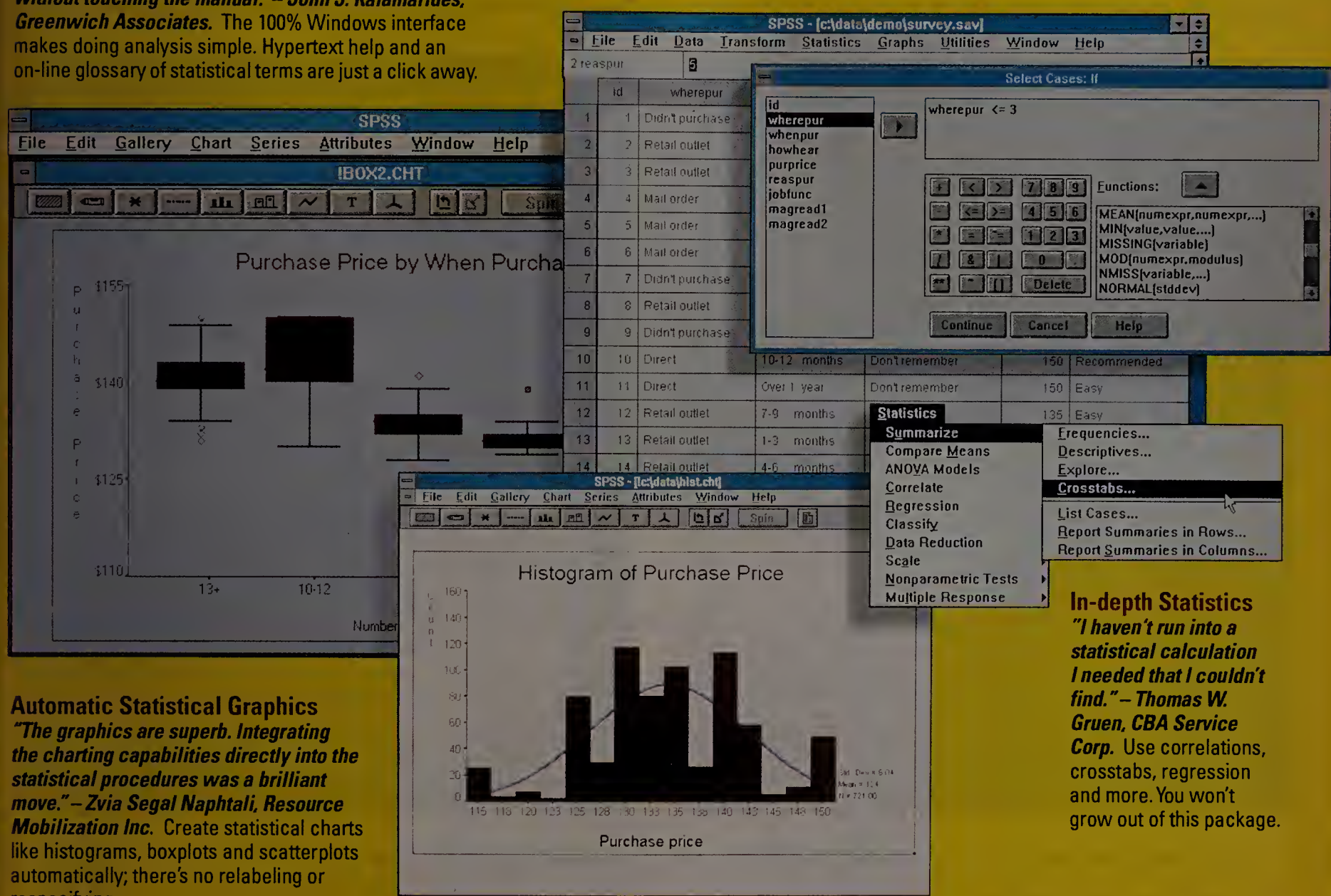

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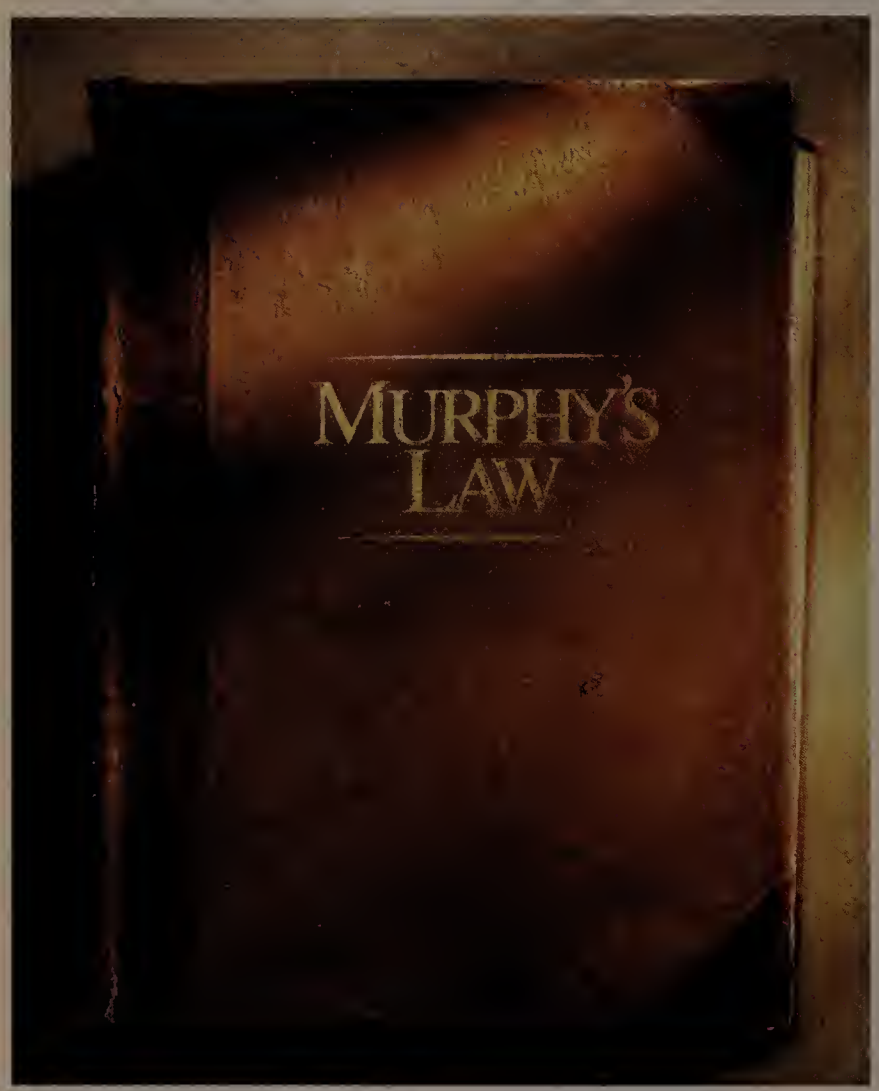

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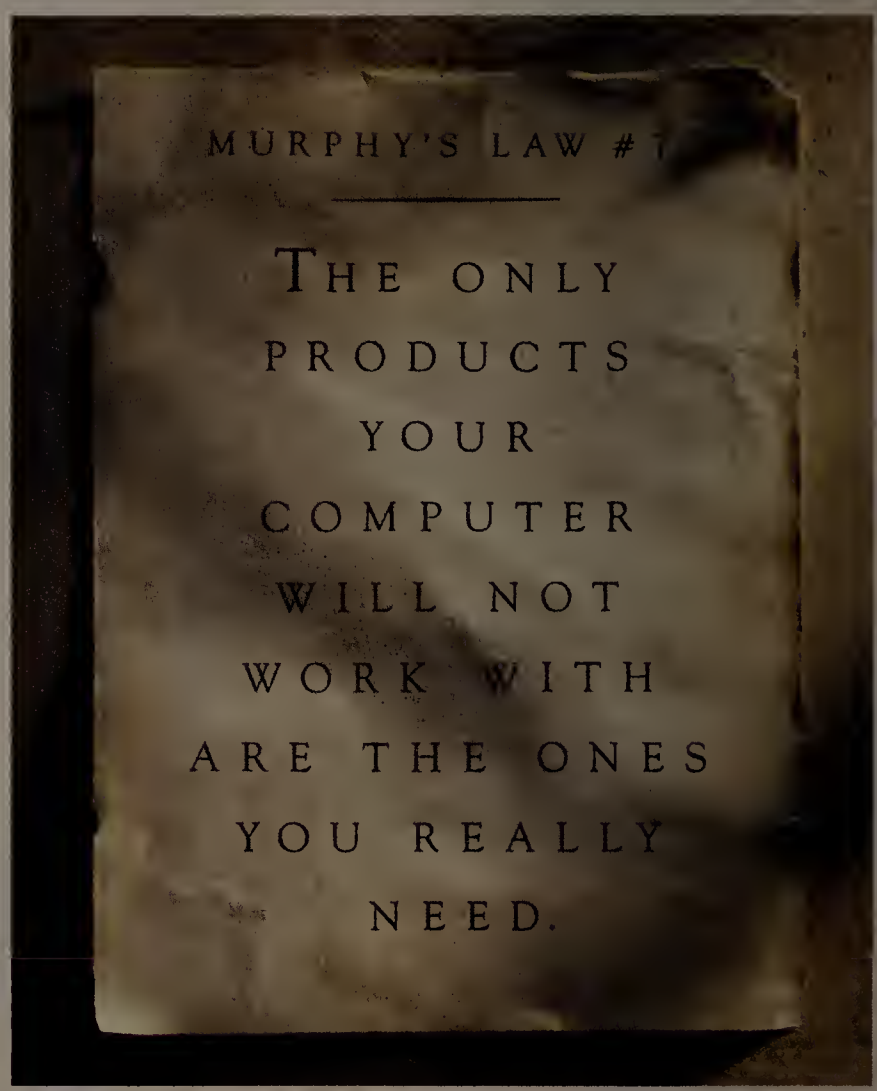

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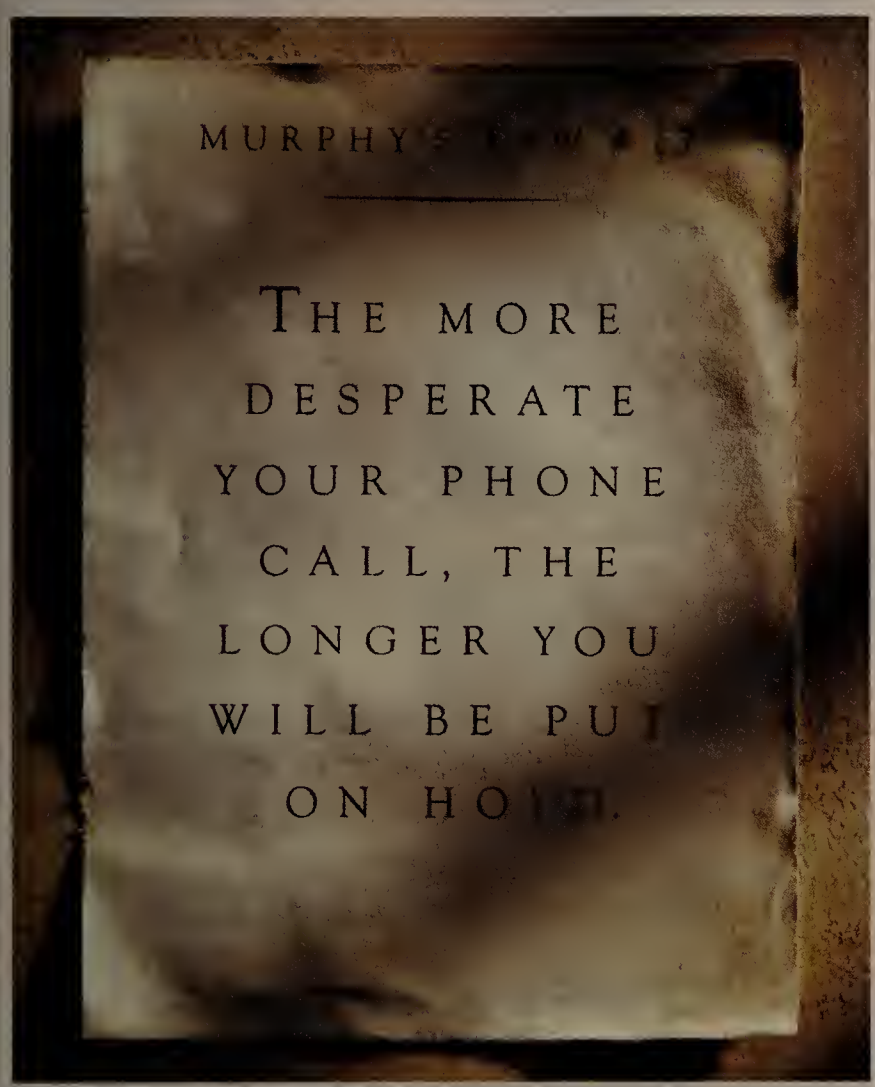

doesn't call back within one hour, let us know and you will receive your choice of a check for $25 or a credit of $25 toward your next purchase.[2]

Now, the price of your system includes this toll-free phone support mentioned in the above guarantee for as long as you own your computer. We'll solve most reported problems over the phone, usually in 10 minutes or less.

We also have a toll-free Getting Started Helpline, 24 hour-a-day system information via our TechFax℠ line and our own Dell Forum on CompuServe's Information Service.

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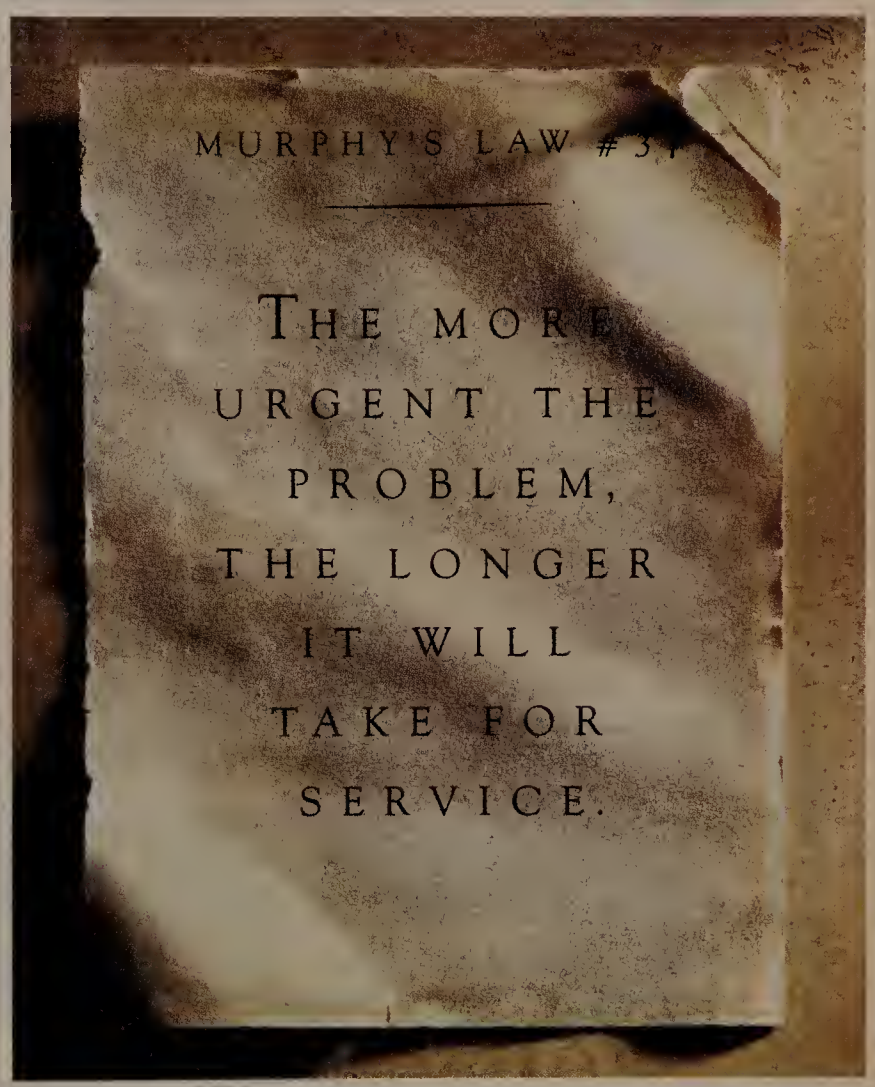

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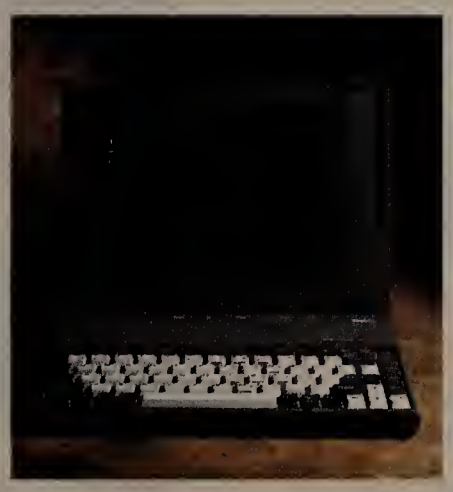

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intel inside

As software applications grow ever more powerful, they also grow more demanding. With each revision, it seems software packages require more memory, larger hard drives, and faster CPUs. Sure, you can run most applications on an AT with just 640K of RAM or a 386SX with a couple of megabytes, but few of us have the patience to wait while our computer slowly does its thing.

You don't have to lay out thousands of dollars to improve performance. A few extra megabytes of RAM here, a faster hard drive there, and who knows, you may be able to breathe new life into the system you already own.

Most of us faced with sluggish performance consider three options to eliminate the bottlenecks: Add memory; install a larger, faster hard drive; and move to a faster processor. The trick is knowing which option makes the most sense for you—both economically and from a performance perspective.

To help guide your decision, we took a customized 20-MHz 386SX ALR PowerFlex Flyer configured with DOS 5.0, 2MB of RAM, VGA graphics, and an 80MB hard drive. We ran it through *PC World*'s system test suite, designed to represent a cross section of user activities—from financial and statistical analysis with *1-2-3 2.2* to indexing a 100,000-record table in *dBASE IV 1.1*.

Using our test system as the benchmark, we then systematically measured the performance of a range of upgrade options—from something as simple as adding additional RAM to investing in a $1000 ESDI drive and controller. The results make one point clear: Each application responds differently to the same upgrade (see the following Test Report). Compare your application suite to ours and then read on for suggestions on how to get the most bang for your upgrade buck.

STRETCHING YOUR

MAYBE YOU DON'T NEED A NEW PC AFTER ALL. WE TEST CPU, MEMORY, DISK, AND VIDEO UPGRADES TO REVEAL WHICH ENHANCE PERFORMANCE BEST FOR FIVE POPULAR APPLICATIONS.

BY TJ BYERS

Math Coprocessor: A Quick and Easy Fix

Sometimes the easy fix really is the best one. That's certainly the case for spreadsheet users who spend a lot of time running heavy-duty statistical or financial calculations. Our tests indicate that for this group of users, a math coprocessor is the most cost-effective solution. This easily installed chip costs just over $200, and in our calculation-intensive tests, it improved spreadsheet performance by a whopping 76 percent. The only hardware upgrade that was more effective

UPGRADE DOLLAR

was the move to a 486-based system.

Other applications in our test suite also benefited from the coprocessor, most notably *dBASE IV*, with a performance improvement of 14 percent.

After running our test suite on the 2MB system, we upgraded to 4MB and 8MB of RAM, repeating the test suite each time. Although all applications in our test suite benefited from effective use of additional memory, the results in many cases were not particularly dramatic. Still, RAM is cheap—a 1MB SIMM costs roughly $50—and everyone with a 2MB system should consider paying the $100 and upgrading to 4MB.

Our *dBASE IV* tests ran 12 percent faster when we upgraded to 4MB of RAM and a full 21 percent faster with 8MB, when an appropriate amount of the extra RAM was used for caching. Given the current low price of memory, *dBASE* users don't have any excuse *not* to upgrade to 8MB. Only our processor upgrades—which are significantly more expensive—had a more dramatic effect on *dBASE IV* performance.

Our *WordPerfect 5.1* tests also responded to the memory upgrade: Our three documents formatted almost 8 percent faster when we added 2MB of RAM and nearly 20 percent faster when we moved to 8MB. If you're a *WordPerfect* user, like *dBASE* users, you should consider adding memory if your system is currently configured with 2MB. You're likely to be pleasantly surprised at the difference.

A word of caution, though: When it comes to adding memory, more isn't always better. DOS applications in our test suite benefited from upgrading to 4MB of RAM, but they can't effectively take advantage of memory beyond 8MB. In fact, performance can actually suffer if you overdose on cache size.

Windows 3.0, though, is the exception to this rule. Some applications, such as *PageMaker*, won't even load with less than 4MB of RAM installed. While the speed gain from 4MB to 8MB is only 11 percent, the extra RAM gives you room to load several *Windows* applications for multitasking.

Bigger, Faster Hard Drives

Most people buy a new hard drive for the additional space, but the upgrade may also give you a performance boost.

For most of the applications we ran, our 80MB IDE drive offered reasonable performance. Only *Paradox* and *dBASE* benefited significantly from the larger, faster drives (although many applications get a marginal boost). Our *Paradox* tests performed almost 8 percent faster when we moved from a 23ms 80MB IDE drive to a 17ms 200MB IDE drive, which carries a street price of roughly $250. Adding a 330MB ESDI drive with a cache controller netted over a 21 percent increase in performance. *dBASE* numbers weren't as impressive, but many may find the 8 percent performance boost from a 200MB hard disk

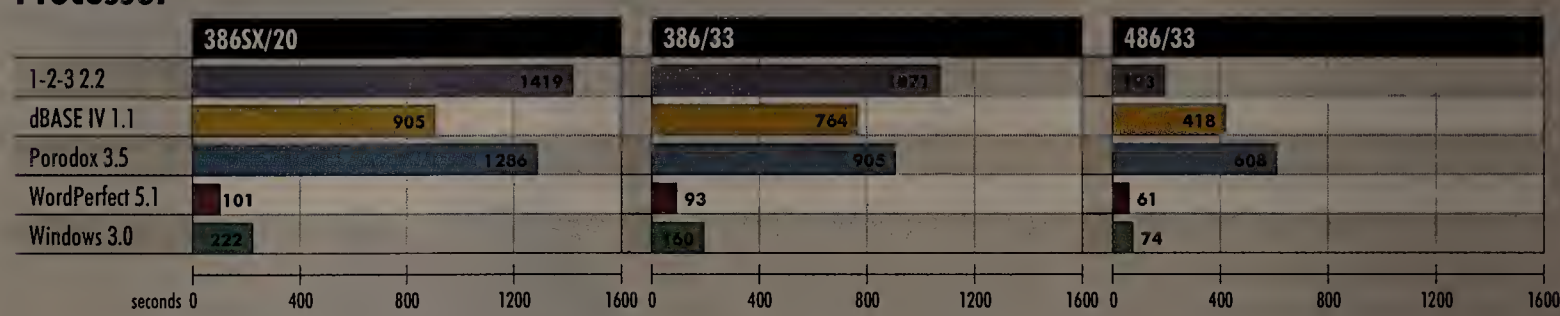
ILLUSTRATIONS BY PHIL ANDERSON

PC WORLD TEST REPORT

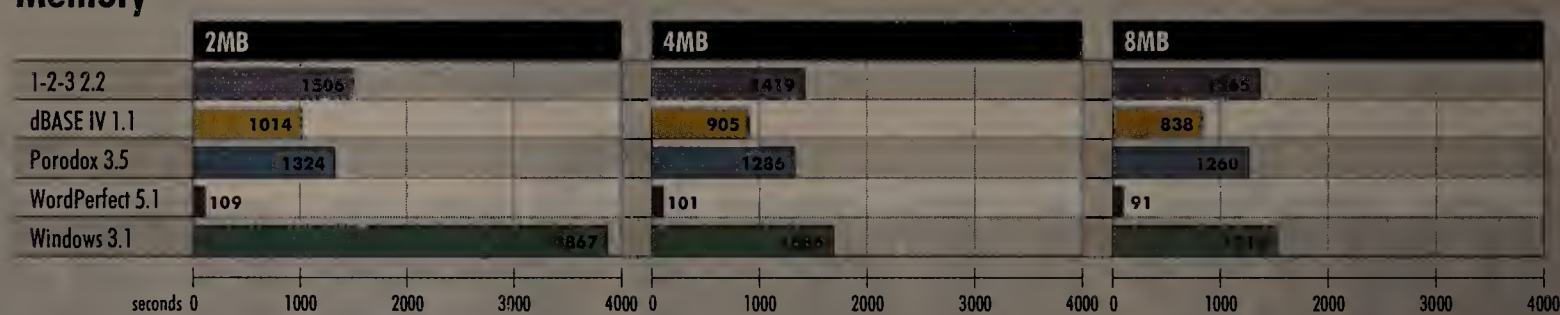
Where's Your Performance Bottleneck?

Mix and match the results of our upgrade tests to see which options give you the most bang for your buck.

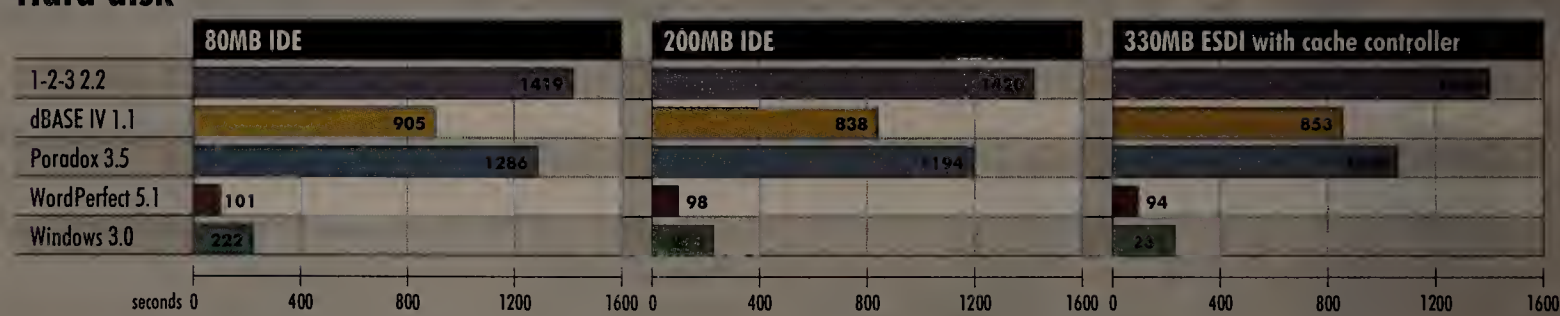
Processor



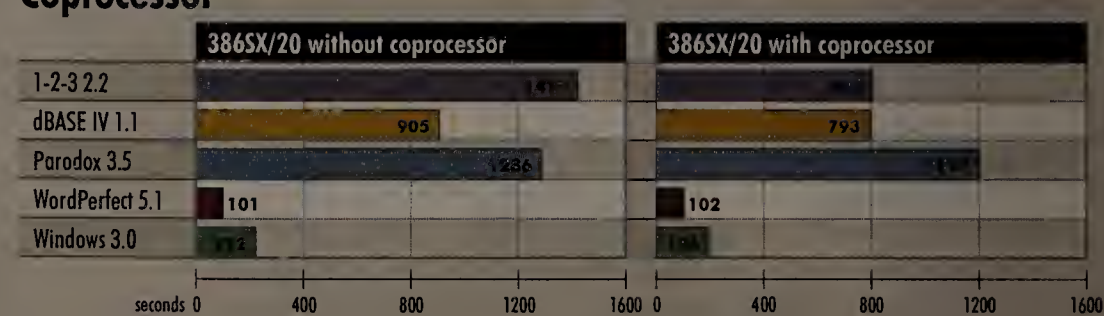
Memory



Hard disk



Coprocessor



Methodology
We first ran the processor, hard disk, and coprocessor application tests on a specially configured 20-MHz 386SX ALR PowerFlex Flyer with a 130MB IDE drive partitioned to 80MB, VGA, and 4MB of RAM. We ran the memory tests on the same system, starting with a 2MB memory configurotian. We then tested applications with the nated hardware upgrades. Processar upgrade tests were run on an ALR PowerPremium. All other upgrades were performed on the original PowerFlex Flyer. We ran the tests using MS-DOS 5.0 and Windows 3.0 or 3.1. (See "486SX PCs: Double-Time Performers," August 1992, for more information on our applicatian test suite.)

Processor
To determine the effect on performance of upgrading the processor, we run our application test suite first on the 20-MHz 386SX ALR PowerFlex Flyer, then on an identically configured ALR PowerPremium. We configure each machine first with a 33-MHz 386DX chip, then with a 33-MHz 486 chip.

Memory
We test the effects of memory upgrades on performance using our standord application suite and a specially designed Windows 3.1 test that includes Excel 4.0, Word for Windows 2.0, Micrografx Designer 3.1, and CorelDraw 2.01. We perform the tests first on the PowerFlex Flyer configured with 2MB of RAM. We then upgrade to 4MB and 8MB. We set up optimum RAM caches for each application, based an input from application develapers.

Hard disk
We take our base PowerFlex Flyer system and replace the 130MB IDE Maxtor drive (partitioned to 80MB) with a 200MB LXT213A IDE Moxtor drive. We then upgrade to a 330MB ESDI drive with an UltraStor 15C 1MB cache controller.

Coprocessor
To our base system we add an Intel 20-MHz 80387 math coprocessor.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

worth the $250 investment, particularly because it more than doubles their storage capacity.

The Total Upgrade

Let's face it: Everyone can benefit from a faster processor. Unfortunately, we don't all have the money in our budget. And based on our tests, dollar for dollar, it's not always the best upgrade path.

Paradox, *Windows*, and *1-2-3* users benefit most from a move to a 386/33 system. In fact, *Paradox*'s 42 percent performance boost, when run on a 386/33, makes a strong case for upgrading to the faster system. With system prices dropping almost daily, you can pick up a fully configured 386/33, including an 80MB to 120MB hard drive, 4MB of RAM, and VGA graphics for under $1500. Although other applications certainly benefit from a similar upgrade, less expensive options, such as adding more memory when running *Windows* or a math coprocessor for financial and statistical *1-2-3* jobs, may make more sense.

Choosing Your Upgrade Path

Before investing in any hardware, you should take a close look at which applications you run most frequently and the most common tasks performed with them. Then compare your application suite with ours. Hardware upgrades are never easy, and there's no such thing as the perfect solution. But by linking individual upgrades to software performance, you'll be able to customize your upgrade path to meet your needs.

TJ Byers is a contributing editor for PC World.

Boosting Windows Performance

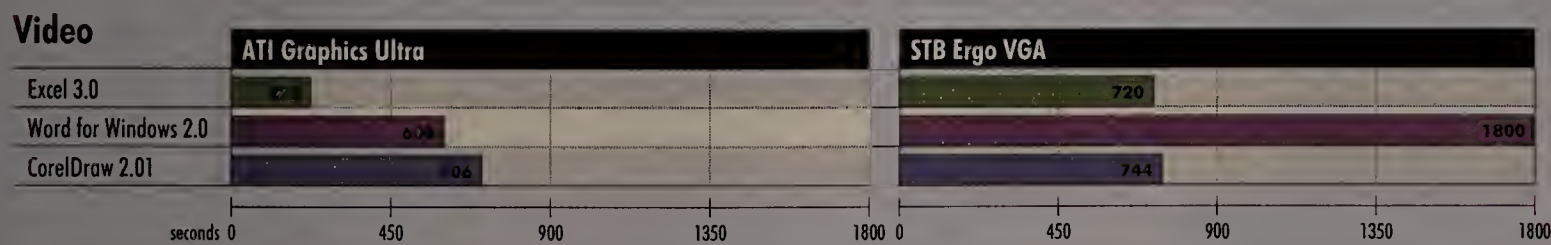
If you spend more time watching *Windows* redraw than you do using its applications, you should consider investing in a *Windows* video accelerator board.

Video accelerators for *Windows* range in price from $100 to $350 and include Aamazing's VGA700, ATI's Graphics Ultra, and Diamond's Stealth Hicolor—all of which previously won Best Buy awards ("Fast Video Boards for Windows," March 1992). These boards speed *Windows* screen redraws by taking the load off the CPU for specific graphics functions, just as a math coprocessor speeds arithmetic calculations by unburdening the CPU of certain math-specific functions.

We ran our test suite using ATI's Graphics Ultra, one of the Best Buys in our March review. Based on our tests, *Windows* spreadsheet and text programs stand to get the biggest boost, with speeds up to three times faster. Drawing programs, such as *CorelDraw*, fare less well, posting results only 5 percent faster than with standard VGA.

Speed isn't the only thing you get with the new boards. In addition to faster redraws, you get better screen resolution and more colors. But higher screen resolution can be a drag on performance. For example, *Excel* spreadsheets scroll five times faster at 640 by 480 resolution than they do at 1024 by 768. And the more colors you use, the longer it takes to paint an image on the screen.

You'll also need to pony up $500 for a multiscan monitor if you don't already have one. While your standard VGA monitor can keep up with the faster *Windows* screen redraws and added colors, it can't support the higher resolutions or flicker-free refresh rates. —*TJ Byers*



Methodology
We tested the video boards with 1MB of RAM. We ran the tests at 1024 by 768 resolution with 256 colors. The benchmarks did not require hard disk access once loaded, so hard disk performance is not a factor. A specially configured 20-MHz 386SX ALR PowerFlex Flyer running MS-DOS 5.0 and *Windows 3.0* was the test system.

Excel 3.0
A 256 by 256 spreadsheet, fully packed with ten characters per cell, is placed in a window on the screen and then maximized. We scroll the spreadsheet page by page three times. This test measures short-vector line drawing speed, which indicates how a board performs with most spreadsheets and draw programs.

Word for Windows 2.0
A 1.44MB text document is scrolled line by line from top to bottom. This test measures bit block transfer (BitBlT) speed, which indicates how a board performs with *Windows* word processing programs.

CorelDraw 2.01
A slide show consisting of 12 drawings created in *CorelDraw* is presented on screen at the rate of 1 slide per second. This test measures bit-map speed, which indicates how a board performs with presentation graphics and draw programs.

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AddStor ... NCP
4090 ▣SuperStor 2.0 ..... 79.
Adobe Systems ... NCP
7547 ▣Adobe Type Manager 2.0 for Windows 65.
6591 ☐Adobe Illustrator 4.0 for Windows..... 389.
5988 ☐Adobe Illustrator Competitive Upgrade 189.
7940 ☐Adobe Type Set Value Pack..... 39.
(Entire Adobe Type Library, from 1 to 275 is available. Call for more information.)
Aldus ... NCP
8000 ☐Persuasion 2.1 for Windows..... 329.
1332 ☐PageMaker 4.2 for Windows ..... 499.
6223 ▣Gallery Effects for Windows ..... 139.
7540 ☐IntelliDraw..... 199.
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1214 ▣Pizazz Plus 3.0..... 79.
Approach Software ... NCP
6598 ▣Approach 1.0 for Windows..... 265.
Ares Software ... NCP
6030 ▣FontMonger 1.0 for Windows ..... 95.
Artisoft ... NCP
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9885 ▣After Dark 2.0 for Windows..... 29.
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8040 ▣FaceLift 1.5 for WordPerfect 5.0/5.1.... 59.
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2089 ▣MakeUp 1.0 for Windows 3.0/3.1 ..... 95.
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9695 ▣Borland C++ 3.0 ..... 325.
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ButtonWare ... NCP
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Caere ... NCP
6568 ▣Omnipage Direct 1.0..... 259.
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3814 dBFast *(3½" only)*..... 339.
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1625 ▣Act! 2.1 ..... 229.
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Gibson Research ... NCP
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IBM ... NCP
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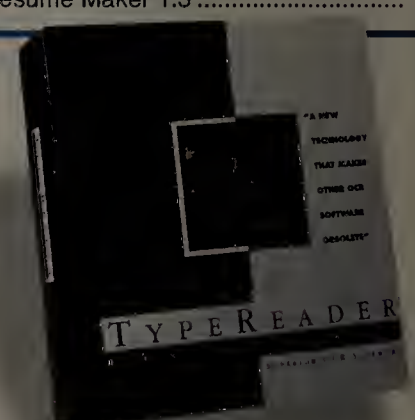
ICOM Simulations ... NCP
1326 ▣Intermission 3.0 for Windows ..... 29.
5696 ▣Squeegee 1.0 for Windows ..... 42.
Individual Software ... NCP
6222 ▣Resume Maker 1.3 ..... 29.



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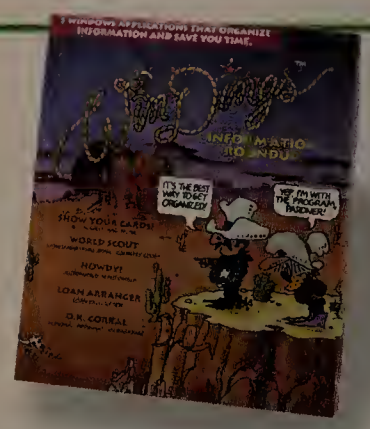

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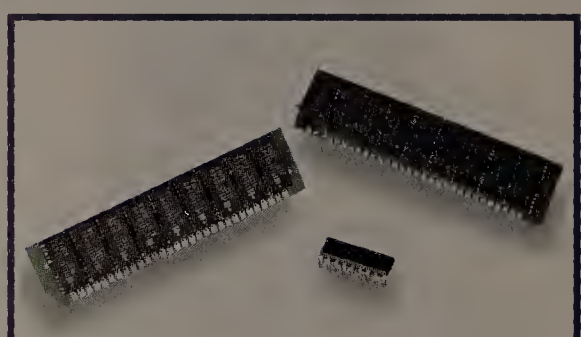

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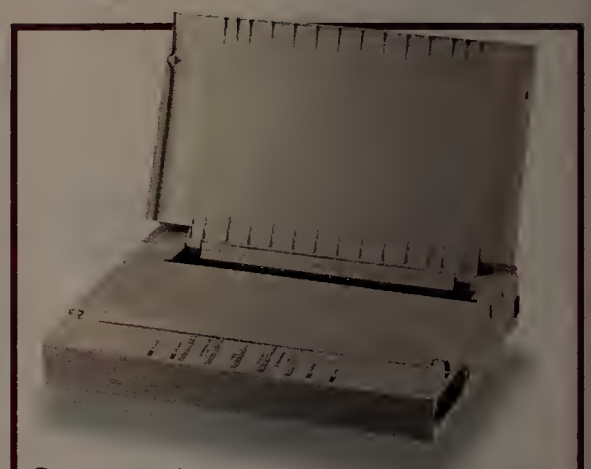

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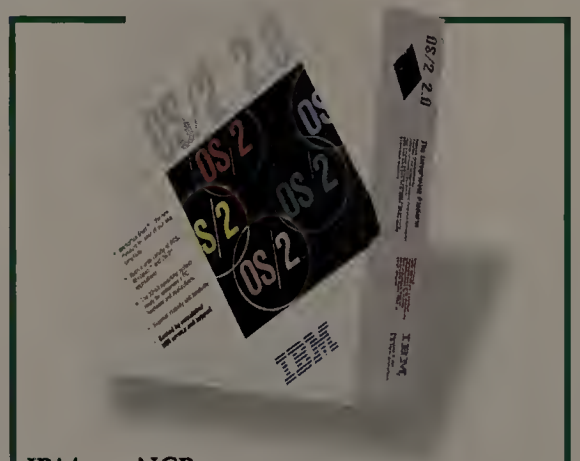

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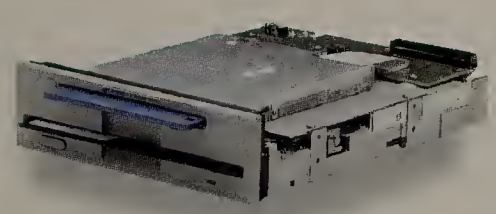

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WIRELESS LANS

Your Next Network?

Thanks to improved performance and greater reliability, networks without cables are becoming increasingly attractive.

The fourth-quarter sales figures, promised by 9 a.m., are nowhere to be found. It's 10:30, and you're sitting in Conference Room A, laptop at your side, preparing to justify that hefty promotional outlay you authorized in August. You know the numbers will bear you out, but without hard data for the board, it's sweaty palms time. Suddenly . . . salvation. A beep from your laptop tells you a message has come over the network. It's the spreadsheet—and the news—you wanted.

If you think there's something wrong with this picture, you probably don't know about wireless LANs. Once upon a time, wireless LANs were expensive and slow. They made sense only when it was impossible or unusually difficult to lay cable: asbestos in the walls, no more room in the conduit, protected historic buildings, offices in adjoining buildings, and so on.

Today, though, wireless LANs are legitimate alternatives to conventional LANs. True, wireless can't yet match cable's throughput, but speeds have improved substantially. (Ethernet claims 10 mbps, token ring 4 or 16 mbps; the fastest wireless touts 5.7 mbps.) In addition, prices have dropped, and with cable-laying costs varying widely depending on locale, it can be cheaper to go wireless.

The demands of a shifting work force also argue for the use of wireless LANs. Many businesses are moving to a "project" model that features reconfigurable work

by Robert Lauriston

GLENN MITSUI

groups—sometimes even temporary workers—and addresses specific problems for set periods of time. Instead of rewiring a floor's worth of cable each time you start a new project, you can lay a wireless LAN on top of your current LAN with little effort or expense.

Finally, business is now a global enterprise, and the ubiquitous go-anywhere notebook PC is a fact of life. Users are becoming accustomed to the flexibility their portable PCs afford them on the road, and they're seeking the same freedom in the office. If your primary PC is portable, you're much more likely to tote it into meetings or colleagues' offices, especially when you can stay connected to the network.

Don't confuse wireless LANs with cellular modems. You can use a cellular modem to access modems attached to your LAN and even to log on remotely, assuming your LAN has that capability. But a cellular modem is as slow as any other modem and is much slower than a wireless LAN adapter.

Ready for Takeoff

Wireless LANs have grown from 8000 nodes in 1989 to 28,000 today, according to the Market Intelligence Research Corporation (MIRC) of Mountain View, California. This rapidly increasing popularity results from equally rapid improvements in the technology. Most significantly, you no longer need to change your existing network in order to go wireless. Wireless LAN hardware now works with NetWare and other popular LANs. You can add wireless workstations to those already hooked to the server by cable or use cable when convenient and wireless when it's cheaper.

MIRC expects the number of wireless nodes to reach 250,000 next year and to break a million by the mid-nineties. Marty Palka, an analyst with Dataquest of San Jose, California, is a bit more conservative. "A few things have to happen before wireless really takes off: better performance, lower cost, and groupware applications that fit the mobile worker."

People generally go wireless to save money, even though conventional networks—network boards, operating systems, and especially servers—keep dropping in price. Network cable itself may be cheap, but the labor required to install it can account for a majority of the network budget.

Installing a new cable may require not only a cable technician, but a whole crew of other contractors as well—plasterers, painters, electricians—often at expensive union rates. If your office is in an old building in a major city, adding new cable can cost hundreds of dollars, sometimes as much as $2000. Tracking down and fixing a break in an existing cable can be even pricier.

Wireless LAN hardware now starts at around $500 a node and can be set up by users with only modest technical skills, so going wireless can significantly reduce or even eliminate cable labor costs. Revenue Canada, the Canadian equivalent of the IRS, recently standardized on NCR's WaveLAN. Even at $1000 per workstation, installing a WaveLAN node costs less than cable did, and the gap is increasing—WaveLAN prices have dropped almost 30 percent since it was introduced.

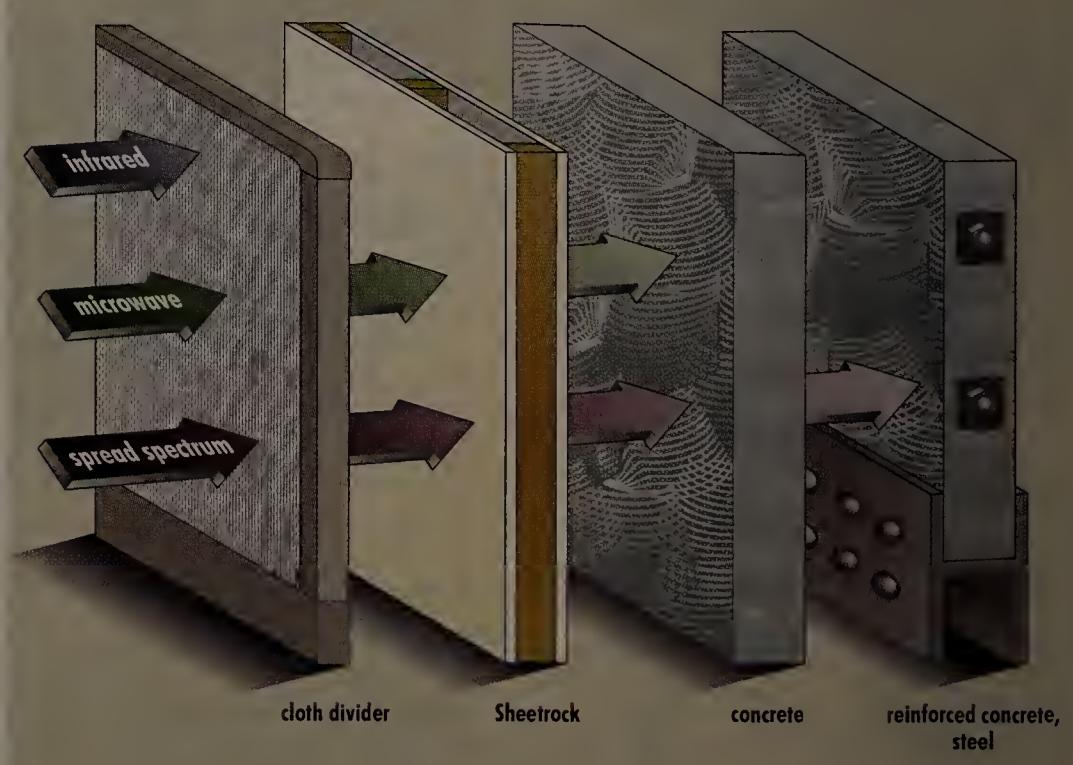
The biggest potential for wireless LANs is to give local users—armed with portable PCs—access to the network. Several companies already sell wireless network boards you can install in laptops. Using such a device, you can say good-bye to parallel-port network adapters or expensive docking stations.

"People are already bringing notebooks into meetings," says wireless pundit Jennifer Pigg, program manager for data communications at The Yankee Group in Boston. "With wireless, you're never in the situation of, 'I have that information; if only I could check my E-mail.' You simply log on to the server and get the files you need."

Three technologies are used in the six wireless LAN systems on the market: spread-spectrum radio, low-power microwave, and infrared. Each approach has its pros and cons.

Spread spectrum, which uses multi-

Wireless LAN Wave Penetration



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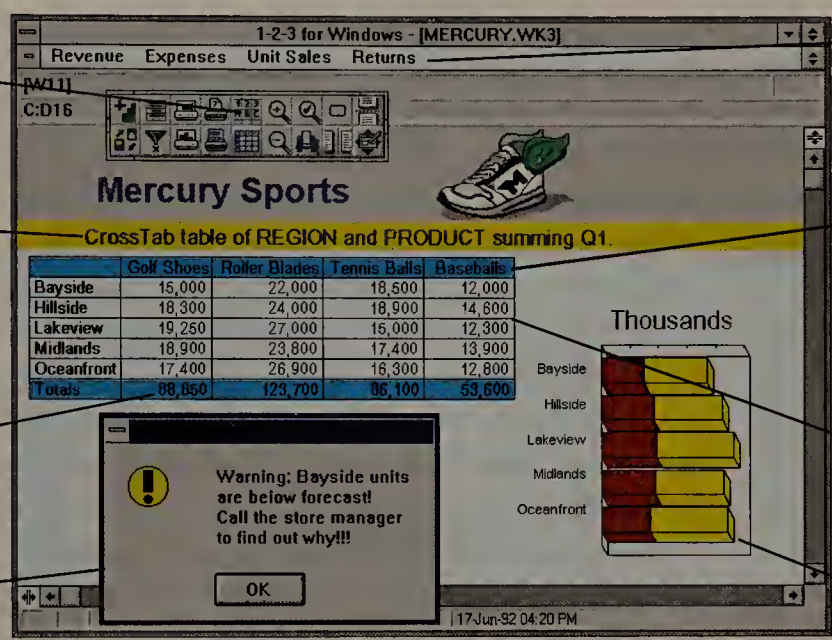

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Lotus 1-2-3 for Windows

*Based on Software Publishers Association data, Q1, 1992, for North America. **This disk is free for current users of 1-2-3 for Windows Release 1.1. New buyers of 1-2-3 for Windows Release 1.1 will find SmartPak in their product package at time of purchase. Network version of 1-2-3 for Windows Release 1.1 is available. Please note that the SmartPak Disk works only with 1-2-3 for Windows Release 1.1. ***Please have credit card and product package ready when you call. **In Canada, call 1-800-GO-LOTUS.** © 1992 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Classic is a registered trademark licensed to Lotus Development Corporation. SmartPak is a trademark of Lotus Development Corporation. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation.

Wireless LANs Play Catch Up

Product	Protocol	Medium	Claimed throughput (mbps)
various	ethernet	wire	10
various	token ring	wire	4 or 16
Altair Plus	ethernet	microwave	3.3
Arlan	ethernet	spread spectrum	1
FreePort	ethernet	spread spectrum	5.7
InfraLAN	token ring	infrared	4
RangeLAN	proprietary	spread spectrum	0.23
WaveLAN	proprietary	spread spectrum	2

ple frequencies to achieve reliable communication with relatively weak signals, is the most popular. There are currently four products available—ARLAN, FreePort, RangeLAN, and WaveLAN—and several more on the way. At the power levels and frequencies used for LANs, spread-spectrum transmission is reliable within a radius of up to 800 feet. In a building with many interior walls, however, that figure can fall to as little as 100 feet. While the signals can pass through most walls, concrete supporting walls will generally block them. Spread-spectrum LANs require no special license, which is convenient but also means they may occasionally clash with other devices sharing the same band.

So far, Motorola, with Altair Plus, has low-power microwave technology to itself. It was the only company to get a license for LAN communications on that band before the FCC put such applications on hold until it figures out a master plan for wireless LANs. Low-power microwave signals can carry a maximum of 120 feet and can usually penetrate drywall but not brick, concrete, or glass. (Don't worry that a microwave LAN will overcook your lunch—the power levels used by the box in your kitchen are 30,000 times stronger.)

The only infrared LAN at the time of this writing is InfraLAN from BICC Communications, recently bought by 3Com. This system uses the same technology as TV remote controls. Transceivers can be separated by up to 80 feet, but to achieve the high speeds necessary for network communications, they must have an unobstructed "view" of each other at all times. To keep passers-by from breaking the connection, you must mount the funny-looking transceivers on poles or on top of office cubicle dividers. Later this year, Photonics Corporation of Campbell, California, plans to ship a line of infrared LAN adapters that will get around this limitation by receiving light that bounces off walls.

Many people worry about network security when they think about broadcasting signals. In fact, all three wireless technologies are *more* secure than regular LAN cables: Wireless signals are relatively weak, while standard LAN cables throw off signals strong enough to be picked up by any well-equipped and determined LAN invader.

Is Wireless for You?

Even if you're sold on wireless, don't expect to kiss cabling good-bye just yet. Wireless generally requires cable between floors, and cable's still your best choice for linking servers to each other and to high-performance workstations. Plus, spread-spectrum and microwave LANs may be unusable in places with a lot of electromagnetic interference (airport control towers, radio stations) and in some situations may interfere with other transmitters or receivers.

If those conditions don't apply to you, though, a wireless LAN could be in your future. Joanne Molyneaux, a partner in the Redwood City, California, firm Sequoia Telecom Associates, certainly thinks so. She believes the biggest challenge wireless now faces is improving its image. "Wire bigots think you can't do wireless successfully. Their reasoning is, 'Cellular is wireless, cellular has poor quality indoors, therefore wireless LANs won't work.' But wireless is *not* cellular. Wireless LAN speeds are high enough, prices are dropping, and they'll soon be directly competitive with wire."

Robert Lauriston is a contributing editor for PC World.

For more information about all products in this article, circle reader service no. 903.

Buyers' Guide

WIRELESS LANS

Wireless LANs are a new technology; some of today's top contenders may be junk tomorrow. Proceed with care as you approach the cutting edge.

Altair Plus

Motorola's 3.3-mbps Altair Plus system replaces only your Ethernet web—you still need an Ethernet adapter in each PC. The advantage of this approach is that you can easily mix wireless and cabled workstations. A cable runs from each of up to eight PCs to a shared user module ($1195), a small box that sits on top of a desk. The user modules are linked by radio to control modules ($3995) mounted on the ceiling, each of which can handle up to 50 workstations. You can hook control modules directly to a server or hang them off your Ethernet backbone. The Altair line also includes the VistaPoint, an $11,500 wireless bridge for linking nets in two buildings. Depending on your setup, installing Altair would cost as little as $250 or as much as several thousand dollars per node, plus Ethernet boards. Motorola, Inc., Altair Product Operations, 3209

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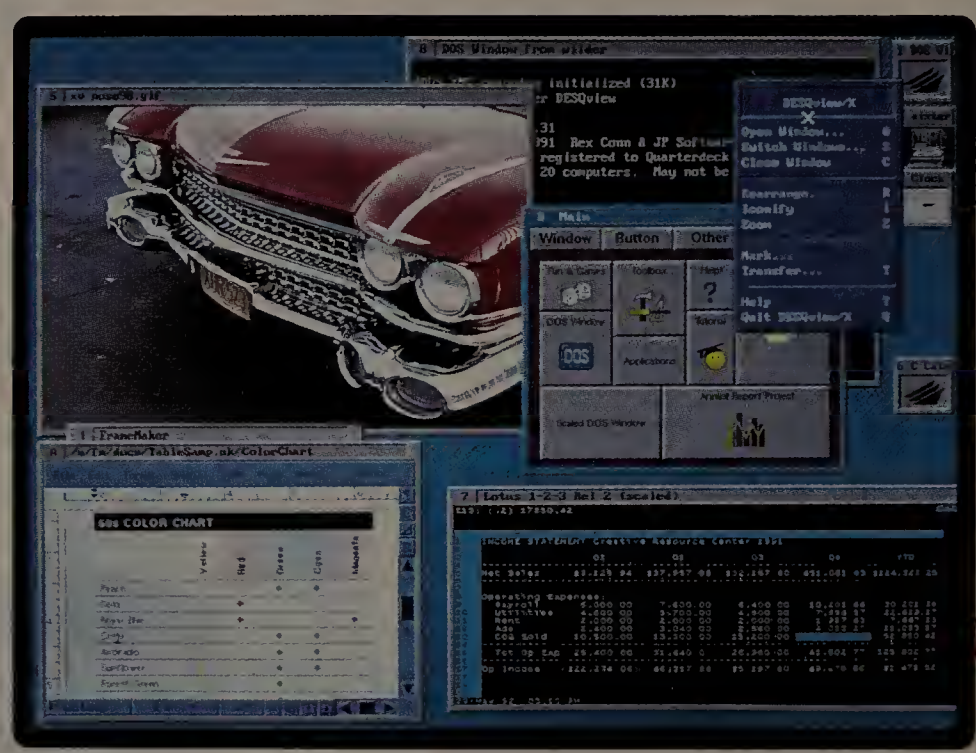
Circle 92 on reader service card

End PC Envy

A Window on the Network

As you can see, DOS programs run alongside Microsoft Windows programs. You've seen this all before in our DESQview, right? Yes, but now there's more. DESQview/X lets you access and control a wide variety of PCs and workstations through your own PC. This feature is called remote computing.

In the example to the right, Lotus 1-2-3 is running in its own 386SX PC. The window at the top of the screen is a DOS window running on a remote 486 PC under DESQview/X. At the lower left is a FrameMaker program running on a remote IBM RS/ 6000 workstation in another part of the company.



Brand and Platform Freedom

DESQview/X runs on 386SX PCs and above. And from within windows on those PCs, you can use programs* running on any number of remote DESQview/X PCs if your network supports NetWare or NetBIOS. Add DESQview/X's optional Network Manager for TCP/IP networks and you can also access programs running on IBM RS/6000s to HP 9000s to Sun workstations. And it works the other way, too: these workstations can view and use DOS programs in their displays.

* DOS graphics programs currently run only on your local PC.

Works the Way You Want

You can change menus, add sub-menus. Add menu items that run remote programs. Change commands. DESQview/X gives you a menu to use for your macros. And if you prefer a graphical desk top instead of a menu, DESQview/X's Application Manager gives you buttons for opening a set of programs used in a project or even for launching remote programs. What's more, you can specify window size and color. And if you are using DOS text programs, you can set them up so that the font changes size as you change the size of the window. We call this feature scalable DOS windows (see the Lotus 1-2-3 window at left).

Looks the Way Users Want

DESQview/X supports sculptured menus, customizable backgrounds, graphic buttons for launching programs, icons and online context-sensitive help to make computing easy and fun. If you are a DESQview user, you'll find DESQview/X very familiar, with an improved look. But if you prefer a different look and feel, we offer two other interface options: OSF/Motif and OPEN LOOK.

Introducing DESQview/X™ for DOS

DESQview/X gives everyone access to the power of the fastest PC—or workstation—on the network.

Remote Computing is a Reality

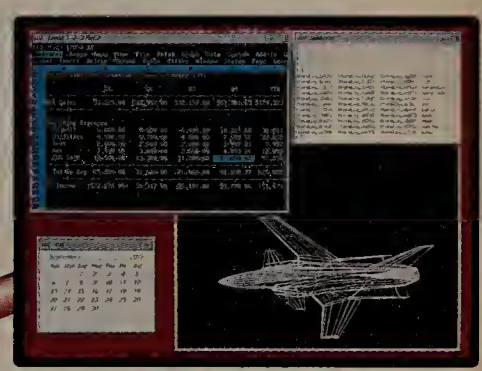
Set up and run programs on remote DESQview/X PCs on your network. Instruct and support users. Diagnose problems and solve them from your own PC. DESQview/X provides controlled access to every program on every PC.

Easy to Set Up and Administer

DESQview/X asks three questions: Do you wish to transfer files to and from other computers? Do you wish to use programs on other computers? and Do you wish other people to have access to programs on your computer? That's all it takes for DESQview/X to set itself up. DESQview/X incorporates QEMM-386 to assure maximum memory utilization and Manifest for easy diagnosis and problem-solving.

Here's How You Might Use DESQview/X on Your Network:

Say for instance your company uses a particular database that requires lots of horsepower or lots of memory to run. You can set it up on a 486 PC loaded with memory — then allow appropriate users access as you normally do on the network. The difference is that the database will be running on the remote 486 instead of the local PC. Users can take advantage of the power they need, when they need it. And you'll be able to best assess who actually needs his/her own 486 PC.



Give your PC the key to unlocking and sharing the power of other PCs on the network.

DESQview/X is a graphical multitasking environment for DOS. It is so powerful that it literally turns DOS PCs into graphical workstations. With DESQview/X, you can run DOS and Microsoft Windows programs simultaneously, view them in windows, transfer between them, create DESQview/X-global or program macros and manage your files.

1991 BYTE AWARDS OF EXCELLENCE

DESQview/X makes computing lots easier, more productive, and more fun.

With DESQview/X, you can now run programs and access files on other computers on the network and view them in windows on your own PC. Distribute tasks among computers based on their capabilities and available resources.

Remote diagnosis and support is now a reality. With DESQview/X you can support, instruct; even remotely demonstrate programs right at your user's computer.

If you have X Window workstations, our optional 'DESQview/X to Other X Systems' TCP/IP Network Manager allows you to run workstation programs remotely from PCs.

For all this power, DESQview/X is stunningly easy to set up and use, and can run on any 386 or 486 PC with as little as 4MB RAM and 40MB hard disk.

DESQview/X multiplies the power of networked PCs by erasing the boundaries between computers; between programs and between users. Welcome to the limitless future of enterprise-wide computing.

Yes! Please Send:

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	DESQview/X			$275.00	
	DESQview/X Network Mgr. (TCP/IP)			$200.00	
	OPEN LOOK interface			$200.00	
	OSF/Motif interface			$250.00	
	Shipping & Handling $10 (Canada & USA only)				
	California Residents add 8.25%				
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Wilke Rd., Arlington Heights, IL 60004; 800/233-0877.

Reader service no. 665

ARLAN

The 1-mbps spread-spectrum ARLAN system, from Telesystems SLW, comprises wireless Ethernet boards ($1290) for PCs and wireless hubs ($2490) that hook to your Ethernet backbone. It uses cellular-phone techniques to hand off transmissions from one hub to another as the workstation moves. ARLAN sees this approach catching on in hospitals and other places where people want to stay logged on as they move about. (Presumably the company will eventually offer an adapter for laptops.) Telesystems SLW also sells a wireless Ethernet bridge (about $10,000 with antennas) that can span 6 miles. Telesystems SLW Inc., 85 Scarsdale Rd. #201, Don Mills, Ontario, M3B 2R2 Canada; 416/441-9966, 416/441-9785 (fax).

Reader service no. 666

FreePort

Windata's new FreePort line of spread-spectrum Ethernet transceivers may offer the fastest wireless yet. By using separate frequencies for server-to-workstation and workstation-to-server transmissions, they claim throughput of up to 5.7 mbps. FreePort's architecture is similar to Altair's: An Ethernet adapter in each PC is connected to an external transceiver ($995 for the single-user model, $595 for an add-on that lets you share it with eight workstations), and the server's Ethernet adapter is connected to a wireless "smart" hub ($4695 for up to 32 transceivers, $5895 for 64). Windata also offers a *Windows*-based graphical network management utility ($2395) that's compatible with the popular SNMP standard. Windata Inc., 10 Bearfoot Rd., Northboro, MA 01532; 800/833-2420, 508/393-3330.

Reader service no. 667

InfraLAN

By using infrared light instead of radio, BICC Communications/3Com's token-ring–based InfraLAN delivers 4-mbps throughput. The InfraLAN unit ($2795) replaces only the token ring MAU, so each PC still needs a network adapter. The InfraLAN MAUs are linked by odd-looking infrared transceivers. You can hook six PCs to each InfraLAN box, or expand that to 14 by attaching a regular MAU. BICC expects to ship an Ethernet version late this year. BICC Communications/3Com, 103 Millbury St., Auburn, MA 01501; 508/832-8650, 508/832-8698 (fax).

Reader service no. 668

RangeLAN

If you've always thought of a wireless LAN as a notebook with an antenna, just plug Proxim's RangeLAN/LT network adapter ($595) into a Compaq LTE's modem slot and you'll feel right at home. There's also the RangeLAN/ISA adapter ($495) for desktop workstations and servers. This spread-spectrum system is slower than others—only 240 kbps—which could make some applications run sluggishly. RangeLAN uses its own protocols, so on a mixed LAN you'd need both Ethernet and RangeLAN cards in the server. With a NOS that doesn't support multiple protocols (such as NetWare 2.*x*), you'd need a separate bridge server to connect the two LANs. Proxim, Inc., 295 N. Bernardo Ave., Mountain View, CA 94043; 415/960-1630, 415/964-5181 (fax).

Reader service no. 669

WaveLAN

NCR's spread-spectrum offering claims 2-mbps speed. The $799 WaveLAN network adapter board is attached to a 5-foot cable so you can position the flat, 3-inch-square antenna on a nearby wall or partition. Options for the board include DES data encryption ($90), a remote boot for diskless workstations ($45), and a directional antenna that allows line-of-sight links of up to 5 miles ($3990 a pair). There's also a MicroChannel version of the board ($1390). As with RangeLAN, you'll need a bridge server or a server with both WaveLAN and Ethernet adapters. NCR Corp., 1334 S. Patterson Blvd., Dayton, OH 45479; 800/225-5627, 513/445-5000.

Reader service no. 670

Printer-Sharing Devices

If all you want to do is share printers, there are wireless alternatives less expensive than full-fledged LANs. These printer-sharing devices are external boxes that plug into the serial port on your PC and printer. They also have adapters that let you hook up printers that have only parallel ports, though maximum throughput is limited to 40 kbps.

CarrierNET ($199 per PC or peripheral) transmits data over AC power lines, though only between outlets connected to the same transformer. Infralink ($320) uses infrared transceivers; LAWN ($398) uses spread-spectrum radio. CarrierNET and LAWN both include E-mail utilities for sending messages or files to other users.

WHERE TO BUY

CarrierNET
Carrier Current Technologies, Inc.
800/222-0377,
704/455-5506 (fax)
Reader service no. 671

Infralink
Infralink of America, Inc.
703/522-4412,
703/522-4737 (fax)
Reader service no. 672

LAWN
O'Neill Communications, Inc.
908/329-4100,
908/329-4101 (fax)
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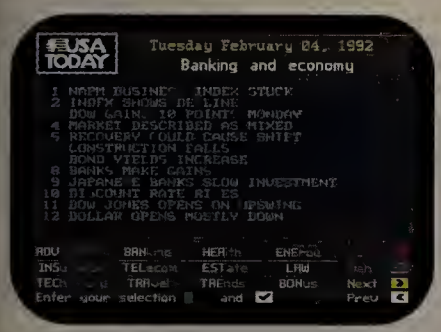

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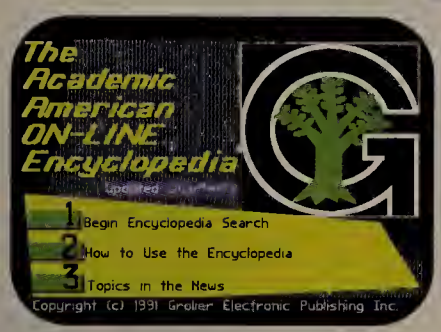

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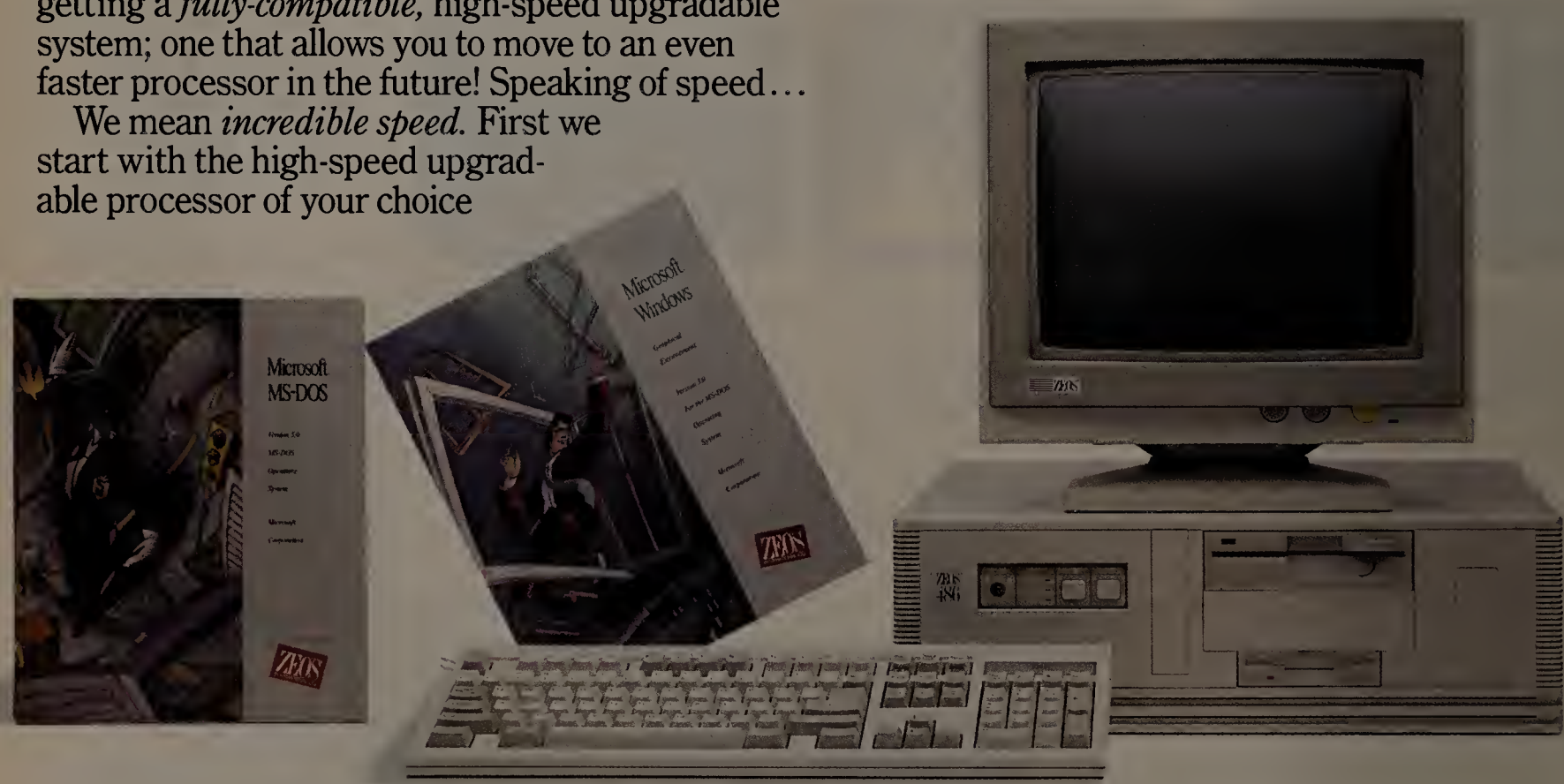

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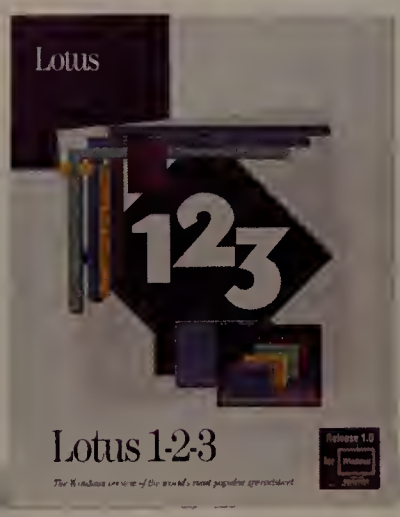

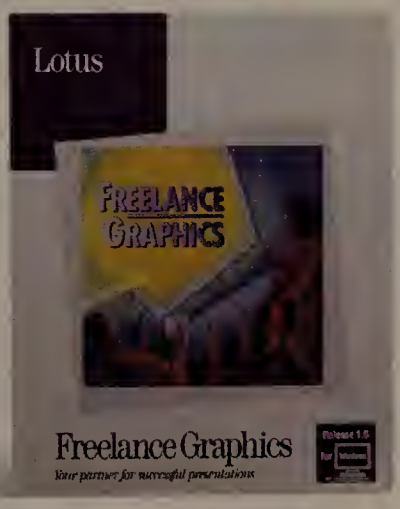

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2-3, Freelance Graphics and Ami Pro of Lotus Development Corporation; Windows and Microsoft of Microsoft Corporation; Z-Card, SpaceSaver and ZEOS
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ANNOUNCING

To create the ZEOS 486SLC, we started at the heart with a brand-new microprocessor from Cyrix.® This hot new chip, with its internal pipeline cache, accesses internal memory with a 32-bit bus. You'll see that the 486SLC-25 delivers more bang for the buck than anything else out there.

You may know Cyrix as the folks who design the unbelievably fast and reliable FasMath™ family of math coprocessors which consistently receive industry accolades. Now Cyrix has applied their high performance design skills to the new 486SLC CPU. And ZEOS makes it scream!

AND HOW DOES IT PERFORM?

We tested it against a typical 386SX-20 and a 386DX-33. We tested it again against a 486SX-20. The results? Check out these benchmarks! The ZEOS 486SLC performed nearly

"...a straightforward, full-size business machine with all the trimmings... delivers fast performance at a 386SX price."

—PC Magazine

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—PC Week

'486 Performance at a '386SX Price.

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twice as fast as a 386SX system, about 1.5 times as fast as a 386DX-33, and it was even faster than a 486SX-20! Now this power is yours at the price of a 386SX.

COMPATIBILITY. 100% GUARANTEED.

This new 486SLC microprocessor is 100% compatible with industry standard software. We're so sure of your satisfaction with the compatibility of your new ZEOS SLC-25 that we're adding *yet another* guarantee to the standard-setting ZEOS warranties and guarantees that back all of our products. We guarantee that during the first six months you own your system, if your ZEOS 486SLC-25 does not work with any of the top 100 selling software titles, ZEOS will replace that PC with a comparable ZEOS 486SX system. And we'll do it absolutely free.

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The Z-Speed Meter reports actual performance differences between these four processor types. Your new 486SLC-25 comes out the winner!

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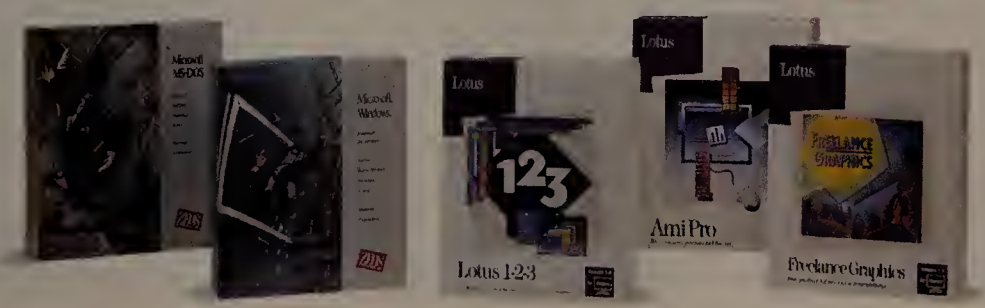

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PORTABLE HARD DRIVES

Need to take your data on the run? Load your files and even your applications onto one of these 125 portable hard drives that plug into any parallel port.

BY SHANE RAU

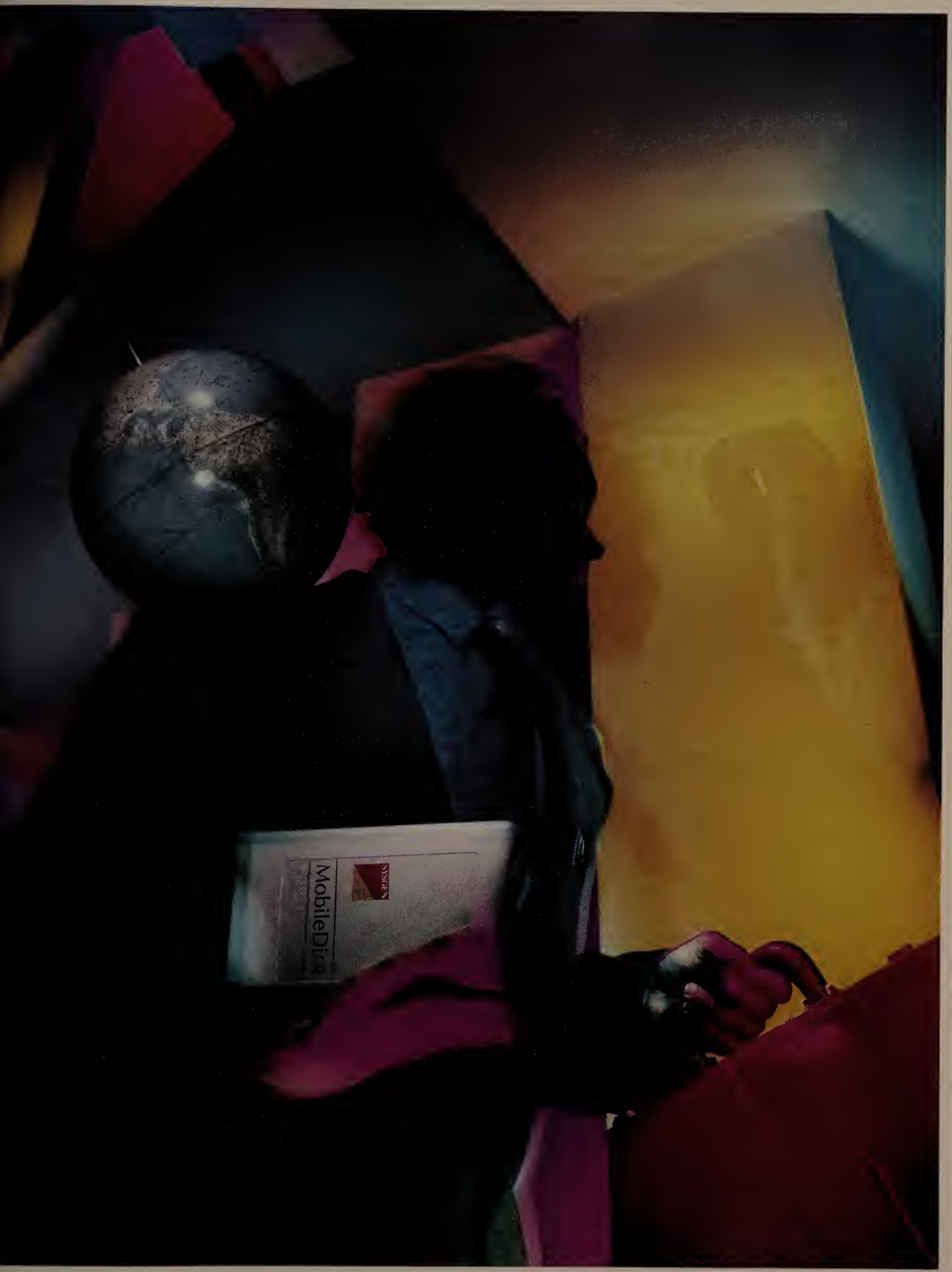
Banish those floppies! Shuttling the contents of your hard disk doesn't have to mean copying dozens of files or packing masses of program disks. Instead, try a portable hard drive and enjoy ample storage in a small, lightweight, self-contained unit.

In this guide, we focus on drives that use a parallel port interface, which makes them truly plug-and-play. You could, for example, hook your drive to your home system, plug it into your notebook while commuting, and then connect it to your office PC. There's no need to reinstall most programs or copy data files. The only stipulation is that the drive must be connected to a bootable PC, since you can't start your system from a parallel-based drive.

If your company is working on top-secret information, you'll appreciate the ease of securing data on a portable drive. Just unplug it and lock it away in a safe. Portables are also handy when you need more storage capacity on a system whose drive bays and expansion slots are full, and they're useful if your laptop's internal disk is full and you don't want to buy a larger internal drive.

This buyers' guide presents a wide variety of portable drives with storage capacities ranging from 20MB all the way to 1.3GB. Some drives are as small and light as a sandwich, weighing in at less than 1 pound, while the heaviest (and most capacious) drive is 11 pounds. Although portables are more expensive than internal units, they're still affordable, ranging in price from $295 to $2999.

Buying a portable hard disk is more complex than purchasing a standard storage device. Not only must you consider capacity and



PHOTOGRAPH BY MICHAEL E. NORTHRUP/STROBOPHOTO STUDIO

performance, you also have to evaluate size, weight, and compatibility.

HAVE DATA, WILL TRAVEL

In a parallel port–based drive, the storage media, controller, and power supply all reside in a single case. To operate the drive, you simply load its drivers onto your boot disk, plug it into your system's parallel port, and restart the system.

Approximately one-third of the drives listed come with a battery. Battery life ranges from 1¾ to 7 hours, longevity to rival that of many notebooks. To extend battery life by as much as a factor of two, choose a drive with a *sleep mode*, which shuts the drive down automatically after a specified period of time.

If you use other parallel devices, be sure to look for a drive with a *parallel pass-through* port. This feature allows you to use another device, such as a printer, by plugging its cable into a port built right onto the drive. All the drives in this buyers' guide come with parallel pass-through.

THE SPEED TRADE-OFF

You won't want a portable parallel-based drive if top speed is essential. Manufacturers admit that these drives are 20 to 50 percent slower than internal units. This sluggishness results from data having to travel through an old-fashioned bottleneck—the PC's parallel port—instead of through the much faster system bus.

The slowdown is more noticeable with graphical data; performance may not suffer with text. You may want to keep a suite of *Windows* applications on your portable drive, but if you do, you'll probably want to copy them to the host machine's hard disk (if it's big enough) to avoid the performance penalty.

Remember the bottleneck, and don't let the listed average access times fool you: A 19ms portable drive won't provide the same performance as an ordinary drive with the same spec. But you can use this number to compare the portable units with one another.

Portable drives have proved notoriously incompatible with DOS commands such as FORMAT, CHKDSK, and FDISK and with many disk optimization utilities. That's why all the drives in this buyers' guide include drivers and utilities that control the disk. To use a portable drive, you'll probably have to relearn some basic disk commands.

The included utilities may have a negative impact on other utilities and applications. *Windows*, for example, may not work at all with certain caching programs. We suggest you confirm with the manufacturer that the drive is fully compatible with *Windows* and your application software.

The most common parallel ports can accept input (read) only 4 bits at a time, but some systems, such as IBM's PS/2s and newer Toshiba laptops, also support 8-bit reads (all PC parallel ports deliver 8-bit output). If you intend to connect to both types of ports, get a drive, like Disctec's, that automatically adjusts to a port's capabilities.

WHAT IF YOU DROP IT?

Most of the drives in this guide have a shock tolerance of 10 g's while operating and

Portable Hard Drives

MANUFACTURER/Product	Capacity (MB)	List price	Dimensions (inches)	Weight (pounds) [1]	Battery life (hours)	Sleep mode	Drive interface	Average access time (ms)	Shock tolerance on/off (g's)	MTBF (thousands of hours)	Reader service number
THE BSE COMPANY											
Flashdrive 25-20	20	$299 [2]	1.5 x 5 x 5	1.5	5	Y	IDE	15–22	5/100	47–100 [3]	751
Flashdrive 25-40	40	$499 [2]	1.5 x 5 x 5	1.5	5	Y	IDE	15–19	5/100	47–100 [3]	751
Flashdrive 25-60	60	$599 [2]	1.5 x 5 x 5	1.5	5	Y	IDE	15–19	5/100	47–100 [3]	751
Flashdrive 25-85	85	$699 [2]	1.5 x 5 x 5	1.5	5	Y	IDE	15–19	5/100	47–100 [3]	751
Flashdrive 25-130	130	$849 [2]	1.5 x 5 x 5	1.5	5	Y	IDE	15–19	5/100	47–100 [3]	751
Flashdrive 35-40	40	$399 [2]	1.5 x 5.5 x 8.8	2.5	n/a	n/a	IDE	15–25	5/100	47–100 [3]	751
Flashdrive 35-80	80	$599 [2]	1.5 x 5.5 x 8.8	2.5	n/a	n/a	IDE	15–25	5/100	47–100 [3]	751
Flashdrive 35-105	105	$649 [2]	1.5 x 5.5 x 8.8	2.5	n/a	n/a	IDE	15–25	5/100	47–100 [3]	751
Flashdrive 35-120	120	$699 [2]	1.5 x 5.5 x 8.8	2.5	n/a	n/a	IDE	15–25	5/100	47–100 [3]	751
Flashdrive 35-220	220	$999 [2]	1.5 x 5.5 x 8.8	2.5	n/a	n/a	IDE	15–25	5/100	47–100 [3]	751
Flashdrive 35-510	510	$1799 [2]	2.5 x 5.5 x 8.8	4	n/a	n/a	IDE	15–25	5/100	47–100 [3]	751
COMPUTER PRODUCTS PLUS											
Plusdrive B20	20	$389	1.5 x 5 x 5	1.5	4	Y	IDE	23	7/70	50	752
Plusdrive B40	40	$529	1.5 x 5 x 5	1.5	4	Y	IDE	25	7/70	50	752
Plusdrive B60	60	$569	1.5 x 5 x 5	1.5	4	Y	IDE	19	7/70	50	752
Plusdrive B85	85	$689	1.5 x 5 x 5	1.5	4	Y	IDE	16	10/100	130	752
Plusdrive B120	120	$969	1.5 x 5 x 5	1.5	4	Y	IDE	17	10/100	150	752
DISCTEC											
XD-60	60	$795 [4]	2.3 x 3.2 x 6.1	1.5	5	Y	IDE	19	10/150	45	753
XD-80	80	$895 [4]	2.3 x 3.2 x 6.1	1.5	5	Y	IDE	19	10/150	45	753
XD-120	120	$1095 [4]	2.3 x 3.2 x 6.1	1.5	5	Y	IDE	19	10/150	45	753

Portable Hard Drives (continued)

MANUFACTURER/Product	Capacity (MB)	List price	Dimensions (inches)	Weight (pounds) [1]	Battery life (hours)	Sleep mode	Drive interface	Average access time (ms)	Shock tolerance on/off (g's)	MTBF (thousands of hours)	Reader service number
LIBERTY SYSTEMS											
3040Q	40	$999 [4]	1.6 x 3 x 5.3	1.8	4	Y	SCSI	16	11/110	150	754
3080Q	80	$1099 [4]	1.6 x 3 x 5.3	1.8	4	Y	SCSI	16	11/110	150	754
5052Q	52	$699 [4]	1.9 x 4 x 7	2	1.75	N	SCSI	12	10/75	250	754
5060C	60	$699 [4]	1.9 x 4 x 7	2	3	Y	SCSI	12	5/75	250	754
50105Q	105	$899 [4]	1.9 x 4 x 7	2	1.75	N	SCSI	12	10/90	60	754
50120C	120	$999 [4]	1.9 x 4 x 7	2	3	Y	SCSI	18	5/90	40	754
50240Q	240	$1299 [4]	1.9 x 4 x 7	2	1.75	N	SCSI	16	7/90	250	754
70340F	340	$1758 [5]	2 x 5 x 7	3	n/a	n/a	SCSI	12	10/65	200	754
70425F	425	$1958 [5]	2 x 5 x 7	3	n/a	n/a	SCSI	12	10/65	200	754
70520F	520	$2158 [5]	2 x 5 x 7	4	n/a	n/a	SCSI	12	5/65	200	754
701000H	1000	$2958 [5]	2 x 5 x 7	4	n/a	n/a	SCSI	10	10/60	300	754
MICROSOLUTIONS											
150040	40	$665	1.5 x 4 x 7.8	2	n/a	n/a	IDE	20	5/50	30	755
150100	100	$795	1.5 x 4 x 7.8	2	n/a	n/a	IDE	20	5/50	30	755
MINDFLIGHT TECHNOLOGY											
HP040P25	50	$576	1.5 x 3.5 x 5.8	0.6	n/a	n/a	SCSI	16	10/100	150	756
HP52P35	52	$546	2 x 4.7 x 7.3	1.6	n/a	n/a	SCSI	17	11/90	60	756
HP080P25	86	$938	1.5 x 3.5 x 5.8	0.6	n/a	n/a	SCSI	16	10/100	150	756
HP105P35	105	$749	2 x 4.7 x 7.3	1.6	n/a	n/a	SCSI	17	11/90	60	756
HP120P25	120	$1128	1.5 x 3.5 x 5.8	0.7	n/a	n/a	SCSI	16	10/100	150	756
HP240P35	240	$1250	2 x 4.7 x 7.3	1.6	n/a	n/a	SCSI	16	7/100	250	756
PACIFIC RIM											
PS40H	40	$599	2 x 6.6 x 7.5	3.2	n/a	n/a	SCSI	25	5/75	20	757
PS80H	80	$799	2 x 6.6 x 7.5	3.2	n/a	n/a	SCSI	19	5/75	100	757
PS120H	120	$899	2 x 6.6 x 7.5	3.2	n/a	n/a	SCSI	19	5/75	40	757
PARALLEL PERIPHERALS TECHNOLOGY											
PH-24i	40	$499	1.5 x 5 x 5	1.5	5	Y	IDE	22	n/a	20	758
PH-28i	80	$899	1.5 x 5 x 5	1.5	5	Y	IDE	22	n/a	20	758
PH-212i	120	$1199	1.5 x 5 x 5	1.5	5	Y	IDE	22	n/a	20	758
PH-226i	260	$1499	1.5 x 5 x 5	1.5	5	Y	IDE	18	n/a	20	758
PH-236i	360	$1999	1.5 x 5 x 5	1.5	5	Y	IDE	18	n/a	20	758
PH-325i	250	$1199	2 x 6 x 8	4	n/a	n/a	IDE	17	5/50	20	758
PH-380i	800	$2699	2 x 6 x 8	4	n/a	n/a	IDE	15	5/50	20	758
PH-31Gi	1000	$2999	2 x 6 x 8	4	n/a	n/a	IDE	13	5/50	20	758
PRIMA STORAGE SOLUTIONS											
Portable Series PDQ 60	60	$840	6 x 2.3 x 7.3	6	n/a	n/a	SCSI	19	75/75	150	759
Portable Series PDQ 85	84	$995	6 x 2.3 x 7.3	6	n/a	n/a	SCSI	19	75/75	150	759
Portable Series PDQ 120	121	$1145	6 x 2.3 x 7.3	6	n/a	n/a	SCSI	19	75/75	150	759
Portable Series PDQ 170	174	$1525	6 x 2.3 x 7.3	6	n/a	n/a	SCSI	17	75/75	150	759
Desktop Series PDQ PR 44	44	$1095	2.3 x 9.8 x 9.5	6	n/a	n/a	SCSI	23	75/75	150	759
Desktop Series PDQ 85	84	$975	2.3 x 9.8 x 9.5	6	n/a	n/a	SCSI	19	100/100	150	759
Desktop Series PDQ PR 88	88	$1295	2.3 x 9.8 x 9.5	6	n/a	n/a	SCSI	23	75/75	150	759
Desktop Series PDQ 120	120	$1185	2.3 x 9.8 x 9.5	6	n/a	n/a	SCSI	19	100/100	150	759
Desktop Series PDQ 200	212	$1675	2.3 x 9.8 x 9.5	6	n/a	n/a	SCSI	16	100/100	150	759
Desktop Series PDQ 360	362	$1945	2.3 x 9.8 x 9.5	6	n/a	n/a	SCSI	12	100/100	150	759
RELAX TECHNOLOGY											
Pocket 50	50	$240 [6]	1 x 4 x 8	4	n/a	n/a	SCSI	11	10/60	60	760
Pocket 105	105	$360 [6]	1 x 4 x 8	4	n/a	n/a	SCSI	11	10/60	50	760
Pocket 60	60	$290 [6]	1 x 4 x 8	4	n/a	n/a	SCSI	17	10/70	150	760
Pocket 80	80	$310 [6]	1 x 4 x 8	4	n/a	n/a	SCSI	17	10/70	150	760
Pocket 120	120	$429 [6]	1 x 4 x 8	4	n/a	n/a	SCSI	17	10/70	150	760
SIMPLICITY COMPUTING											
Portable Drive 40MB	40	$499 [4]	1.2 x 4.6 x 8	2	7	N	IDE	25	5/75	100	761
Portable Drive 80MB	80	$699 [4]	1.2 x 4.6 x 8	2	7	N	IDE	19	5/75	100	761
Portable Drive 120MB	120	$899 [4]	1.2 x 4.6 x 8	2	7	N	IDE	19	5/75	100	761
Portable Drive 170MB	170	$1299 [4]	1.2 x 4.6 x 8	2	7	N	IDE	15	5/75	100	761
Portable Drive 212MB	212	$1499 [4]	1.2 x 4.6 x 8	2	7	N	IDE	15	5/75	100	761
Portable Drive 340MB	340	$1999 [4]	1.8 x 4.6 x 8	2.5	4	N	IDE	12	5/50	150	761

[1] Weight does not include AC adapter.
[2] Reflects dealers' average pricing as of 5/5/92; diskless kits available with case and software for $199.
[3] Worst- and best-case MTBF figures.
[4] Battery is extra-cost option.
[5] Includes cost of parallel-to-SCSI adapter sold separately.
[6] Includes cost of parallel-to-SCSI adapter and SCSI terminator sold separately.

Table continues on following page.

Portable Hard Drives (continued)

MANUFACTURER/Product	Capacity (MB)	List price	Dimensions (inches)	Weight (pounds) [1]	Battery life (hours)	Sleep mode	Drive interface	Average access time (ms)	Shock tolerance on/off (g's)	MTBF (thousands of hours)	Reader service number
STORAGE DEVICES											
SHD-40	40	$459 [2]	2 x 9 x 11	7	2	Y	SCSI	29	10/75	20	762
SHD-100	100	$699 [2]	2 x 9 x 11	7	2	Y	SCSI	25	10/50	20	762
SHD-200	200	$899 [2]	2 x 9 x 11	7	2	Y	SCSI	16	10/50	20	762
SHD-780	670	$1999 [2]	5 x 6.5 x 13.8	11	2	Y	SCSI	16	10/50	150	762
SHD-1600	1340	$2699 [2]	5 x 6.5 x 13.8	11	2	Y	SCSI	13.5	10/50	150	762
SYSGEN											
MD 40	42	$550	2 x 4.7 x 7.8	2.3	n/a	n/a	IDE	28	5/75	100–150 [3]	763
MD 80	84	$795	2 x 4.7 x 7.8	2.3	n/a	n/a	IDE	19	5/75	100–150 [3]	763
MD120	120	$895	2 x 4.7 x 7.8	2.3	n/a	n/a	IDE	19	5/75	100–150 [3]	763
MD200	210	$1250	2 x 4.7 x 7.8	2.3	n/a	n/a	IDE	15	5/75	100–150 [3]	763
SYSTEMS PERIPHERALS CONSULTANTS											
QP 20	20	$275	1.3 x 5 x 5	1.3	5	Y	IDE	19	10/100	60	764
QP 40	40	$445	1.3 x 5 x 5	1.3	5	Y	IDE	19	10/100	60	764
QP 60	60	$595	1.3 x 5 x 5	1.3	5	Y	IDE	15	10/100	150	764
QP 80	80	$695	1.3 x 5 x 5	1.3	5	Y	IDE	15	10/100	150	764
QP 120	120	$895	1.3 x 5 x 5	1.3	5	Y	IDE	15	10/100	150	764
Export 40T	40	$295 [2]	2 x 5 x 7	2.5	5	Y	SCSI	19	10/100	50	764
Export 80T	80	$445 [2]	2 x 5 x 7	2.5	5	Y	SCSI	19	10/100	50	764
Export 120T	120	$695 [2]	2 x 5 x 7	2.5	5	Y	SCSI	19	10/100	50	764
Export 200T	200	$795 [2]	2 x 5 x 7	2.5	5	Y	SCSI	19	10/100	50	764
Export 425T	425	$1295 [2]	2 x 5 x 7	2.5	5	Y	SCSI	12	10/100	50	764
Export 537T	537	$1495 [2]	2 x 5 x 7	2.5	5	Y	SCSI	12	10/100	50	764
TIDAL TECHNOLOGY											
SlimFox HD60	60	$699	5.5 x 2 x 8.5	2.5	n/a	n/a	SCSI	19	5/50	150	765
SlimFox HD130	130	$999	5.5 x 2 x 8.5	2.5	n/a	n/a	SCSI	15	5/50	150	765
SlimFox HD210	213	$1499	5.5 x 2 x 8.5	2.5	n/a	n/a	SCSI	12	5/50	150	765
SlimFox HD525	525	$2569	5.5 x 2 x 8.5	3	n/a	n/a	SCSI	12	5/50	150	765
TULIN TECHNOLOGY											
HSPS40B	40	$429	1.4 x 5.5 x 7.5	2.5	n/a	n/a	SCSI	25	5/75	50–100 [3]	766
HSPS60B	60	$479	1.4 x 5.5 x 7.5	2.5	n/a	n/a	SCSI	19	5/75	50–100 [3]	766
HSPS85B	85	$519	1.4 x 5.5 x 7.5	2.5	n/a	n/a	SCSI	17	5/75	50–100 [3]	766
HSPS120B	120	$599	1.4 x 5.5 x 7.5	2.5	n/a	n/a	SCSI	19	5/75	50–100 [3]	766
HSPS170B	170	$709	1.4 x 5.5 x 7.5	2.5	n/a	n/a	SCSI	17	5/75	50–100 [3]	766
HSPS210B	210	$809	1.4 x 5.5 x 7.5	2.5	n/a	n/a	SCSI	12	5/75	50–100 [3]	766
HCPS40B	40	$429	2.8 x 5.5 x 7.5	4	n/a	n/a	SCSI	25	10/200	50–100 [3]	766
HCPS120B	120	$619	2.8 x 5.5 x 7.5	4	n/a	n/a	SCSI	19	10/200	50–100 [3]	766
HJPS40B	40	$469	2.2 x 7.1 x 7.1	4	n/a	n/a	SCSI	25	5/75	50–100 [3]	766
HJPS52QB	52	$489	2.2 x 7.1 x 7.1	4	n/a	n/a	SCSI	17	6/75	50–100 [3]	766
HJPS85B	85	$539	2.2 x 7.1 x 7.1	4	n/a	n/a	SCSI	12	5/75	50–100 [3]	766
HJPS105QB	105	$639	2.2 x 7.1 x 7.1	4	n/a	n/a	SCSI	17	6/75	50–100 [3]	766
HJPS120B	120	$659	2.2 x 7.1 x 7.1	4	n/a	n/a	SCSI	19	5/75	50–100 [3]	766
HJPS330FB	330	$1359	2.2 x 7.1 x 7.1	4	n/a	n/a	SCSI	12	5/50	50–100 [3]	766
HJPS426B	426	$1399	2.2 x 7.1 x 7.1	4	n/a	n/a	SCSI	14	5/50	50–100 [3]	766
HJPS520FB	520	$1439	2.2 x 7.1 x 7.1	4	n/a	n/a	SCSI	12	5/50	50–100 [3]	766
HJPS1000MB	1000	$2469	2.2 x 7.1 x 7.1	4	n/a	n/a	SCSI	12	5/50	50–100 [3]	766
VISION LOGIC											
VL800-40	40	$450	1.2 x 5.6 x 8.5	3	n/a	n/a	IDE	19	5/75	150	767
VL800-80	80	$545	1.2 x 5.6 x 8.5	3	n/a	n/a	IDE	17	5/75	150	767
VL800-120	120	$650	1.2 x 5.6 x 8.5	3	n/a	n/a	IDE	17	5/75	150	767
VL800-200	200	$850	1.2 x 5.6 x 8.5	3	n/a	n/a	IDE	17	5/75	150	767
VL900-40	40	$350	1.2 x 5.6 x 8.5	3.2	4	Y	IDE	18–25	100/900	100	767
VL900-60	60	$399	1.2 x 5.6 x 8.5	3.2	4	Y	IDE	18–25	100/900	100	767
VL900-80	80	$499	1.2 x 5.6 x 8.5	3.2	4	Y	IDE	18–25	100/900	100	767
VL900-100	100	$599	1.2 x 5.6 x 8.5	3.2	4	Y	IDE	18–25	100/900	100	767
VL900-180	180	$899	1.2 x 5.6 x 8.5	3.2	4	Y	IDE	18–25	100/900	100	767
VL1000-40	40	$490	2.6 x 5.5 x 9	5	n/a	n/a	IDE	17	5/75	150	767
VL1000-80	80	$580	2.6 x 5.5 x 9	5	n/a	n/a	IDE	17	5/75	150	767
VL1000-120	120	$685	2.6 x 5.5 x 9	5	n/a	n/a	IDE	17	5/75	150	767
VL1000-200	200	$890	2.6 x 5.5 x 9	5	n/a	n/a	IDE	17	5/75	150	767
VL1000-500	500	$999	2.6 x 5.5 x 9	5	n/a	n/a	IDE	17	5/75	150	767

[1] Weight does not include AC adapter.
[2] Battery is extra-cost option.
[3] Worst- and best-case MTBF figures.

For more information about all products in this table, circle reader service no. 901.

Portable Storage Alternatives

Portable hard disks that plug into a parallel port offer the ultimate in mobile plug-and-play storage. However, some people may prefer to transport only the high-density media and leave the drive at home. Others see the relatively low throughput of parallel devices as an unacceptable trade-off.

Removable-media options include high-capacity floppies, floptical disks, disk cartridges, and erasable-optical disks. All provide *incremental storage.* When the disk or cartridge is full—whether it's a 20MB floppy or a 1.3GB erasable-optical disk—you can simply slip in a new one, making storage essentially unlimited. Incremental storage has obvious benefits for backup and archiving. And with the increasing speed of these devices, some users are turning to a removable-media drive as their primary storage device. In addition, shipping a disk or cartridge is safer and cheaper than sending an entire drive.

There are two other options: external drives that require a controller card, and removable hard disks. Both provide better throughput than drives that use parallel ports, performing as fast as ordinary internal hard drives. The downside is that each machine that uses the mobile drive must have a controller or, in the case of the removable hard drive, a special bay with a slide-in connector at the rear.

In addition, you'll want to consider the cost, capacity, and physical size of various storage options. Here's a quick rundown of the technology behind each, and suggested applications.

VERY HIGH DENSITY FLOPPY DRIVES

VHDF drives use special techniques to read and write up to 21MB on 3½-inch disks. The drives look identical to typical 3½-inch drives but do not read 720K, 1.44MB, or 2.88MB disks.

Suggested applications:

- carrying data between VHDF systems
- shipping applications and data
- performing incremental backups

FLOPTICAL DRIVES

Floptical drives combine optical tracking and magnetic recording techniques to write to and read floppy disks of up to 20MB in capacity. They are identical in appearance to standard 3½-inch floppy drives and, unlike VHDF drives, are compatible with lower-capacity floppies. They're also slower than VHDF drives.

Suggested applications:

- carrying data between floptical drive systems
- shipping applications and data
- performing incremental backups

CARTRIDGE DRIVES

Removable-cartridge drives read and write data on 5¼-inch, Winchester-style magnetic disks sealed in a durable plastic casing. They're the fastest of the removable-media options and come in sizes up to 90MB.

Suggested applications:

- carrying data between cartridge drive workstations
- shipping applications and data
- short-term archiving
- as a primary drive that can be removed for security
- performing full backups

ERASABLE-OPTICAL DRIVES

Erasable-optical drives write to and read optical disks. Typically, the drives use the SCSI interface, so you can hook them to an existing SCSI controller. Erasable-optical disks last about 25 years and can't be magnetically erased.

Suggested applications:

- long-term archiving
- carrying applications and data between equipped workstations
- shipping data and applications

REMOVABLE AND EXTERNAL HARD DRIVES

Removable hard drives combine media and drive mechanisms in a shockproof casing that plugs into a special docking unit. External hard drives that don't use the parallel port use an internal controller. Both are just as fast as any internal drive and come in a wide range of capacities.

Suggested applications:

- carrying data and application suites between specially equipped workstations
- as a primary drive that can be removed for security
- performing fast full backups

	Capacity	Width (inches)	Access time	Data transfer rate	Media cost (per MB)	MTBF (hours)
Very high density floppies	21MB	3½	35ms	1250K/sec	$1	30,000
Flopticol drives	20MB	3½	65ms	200K/sec	$1	30,000
Cortridge drives	up to 90MB	5¼	19ms	1250K/sec	$1.50	30,000 to 60,000
Erasable optical drives	128MB to 1.3GB	3½, 5¼	35ms to 90ms	1500K/sec	$2 to $5	30,000
Removable ond external hard drives	20MB to 1.3GB	1⅝ to 5¼	10ms to 23ms	5MB/sec to 10MB/sec	$5 to $15	150,000

100 g's while turned off. Manufacturers say that dropping a drive 3 feet onto a concrete floor represents 150 g's of force, so if you're willing (and able) to stop short of that, your data should remain well protected.

MTBF (mean time between failure) reflects the manufacturer's estimate of how long the drive will run before it fails, and figures range from 20,000 to 300,000 hours. All the drives come with a one-year warranty and a 30-day money-back guarantee in case of incompatibility or failure.

Although parallel-based battery-powered drives offer the most portability, consult "Portable Storage Alternatives" before you make up your mind. Whichever technology you choose, remember that taking your data with you is better than leaving it behind in a stationary PC where you can't use it—and where somebody else can.

Shane Rau is a senior hardware support specialist for M&T Publishing in San Mateo, California.

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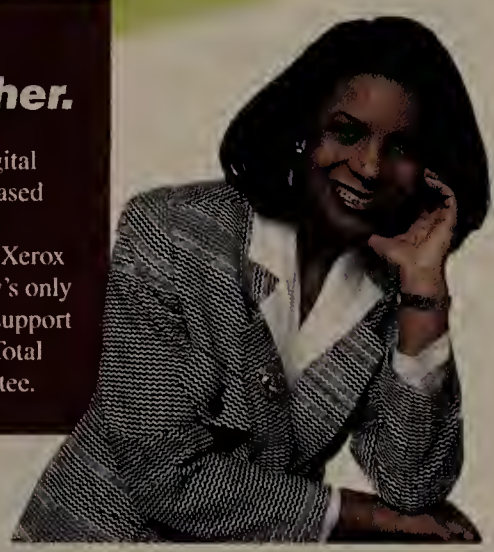

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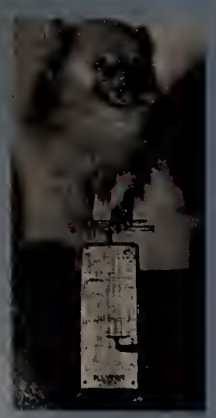

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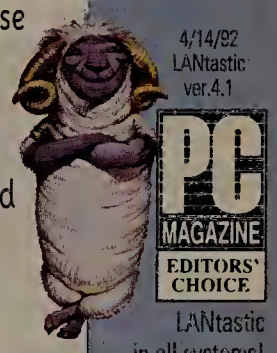

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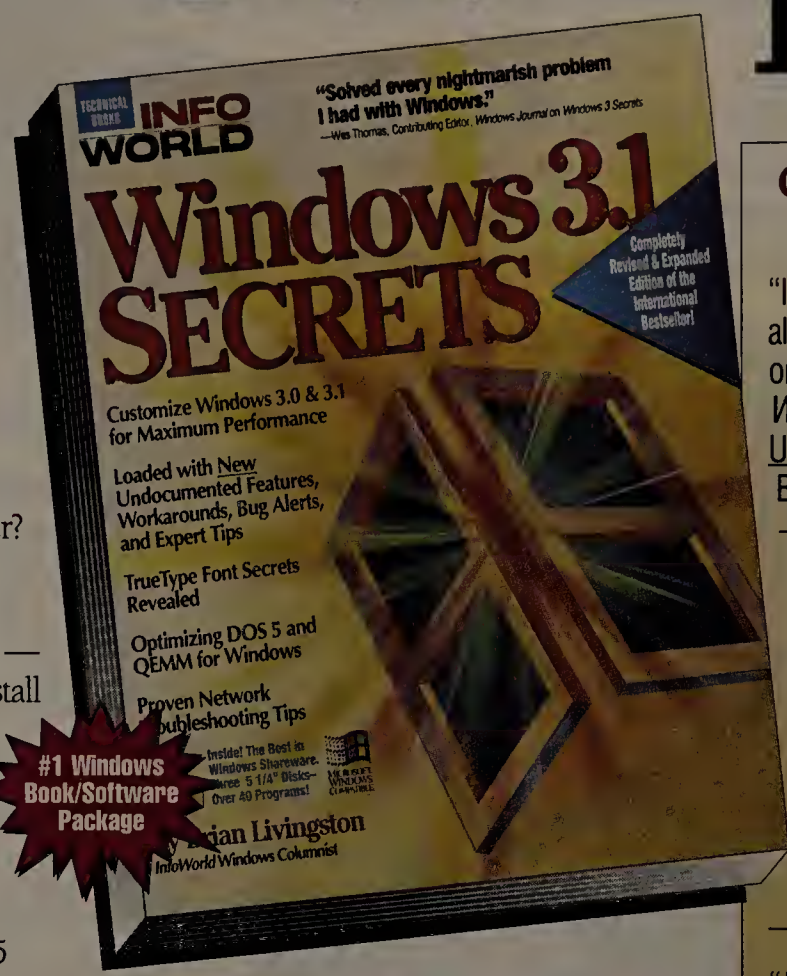

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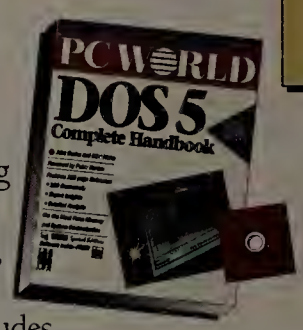

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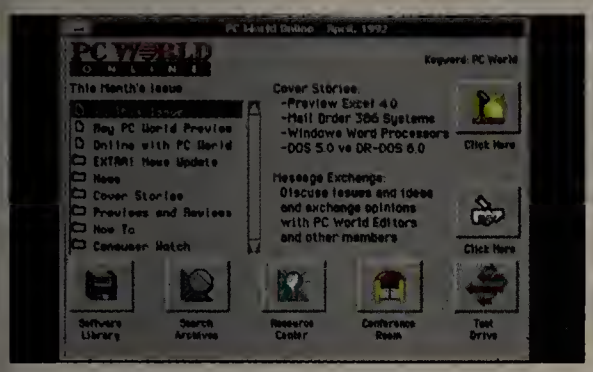

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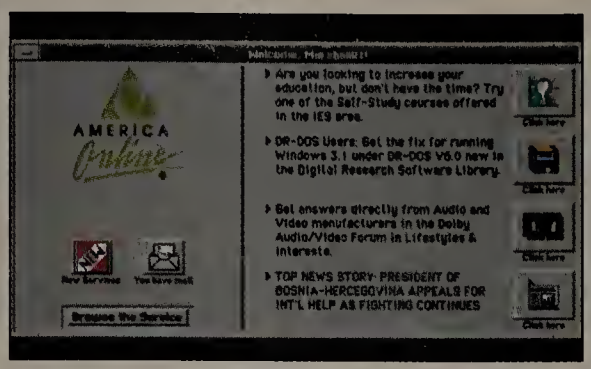

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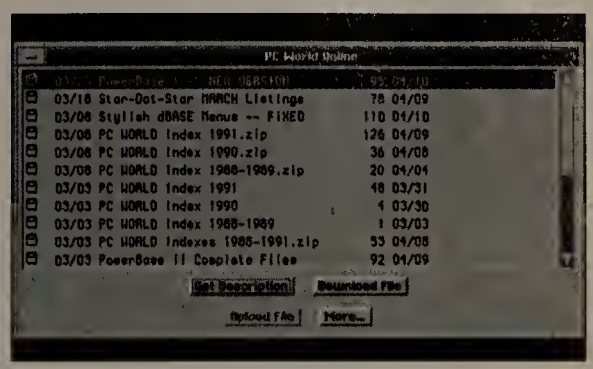

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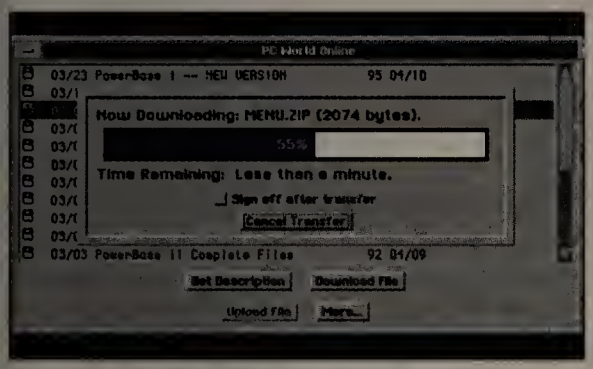

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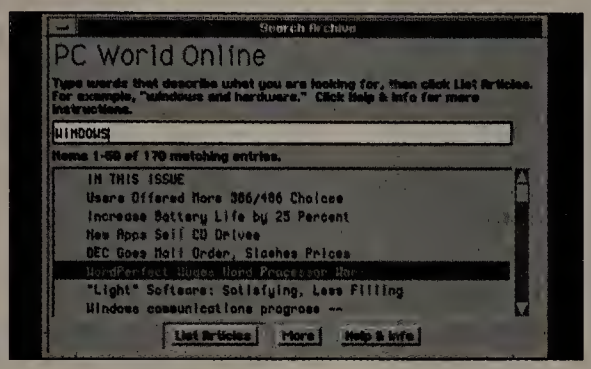

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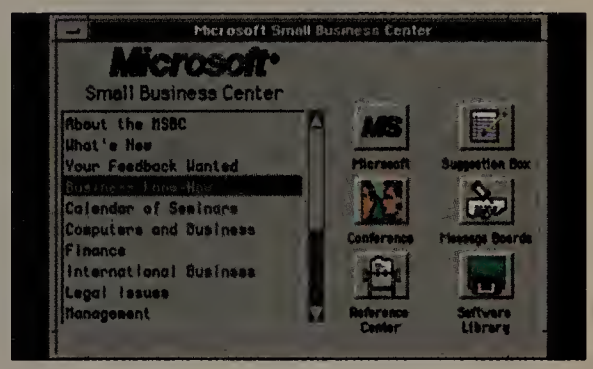

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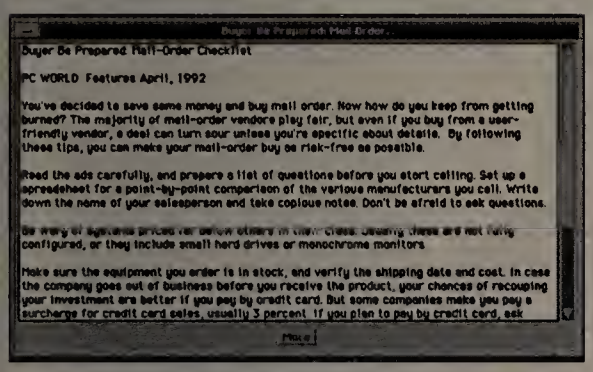

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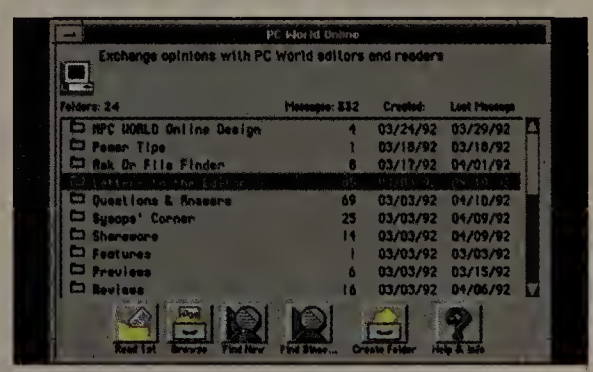

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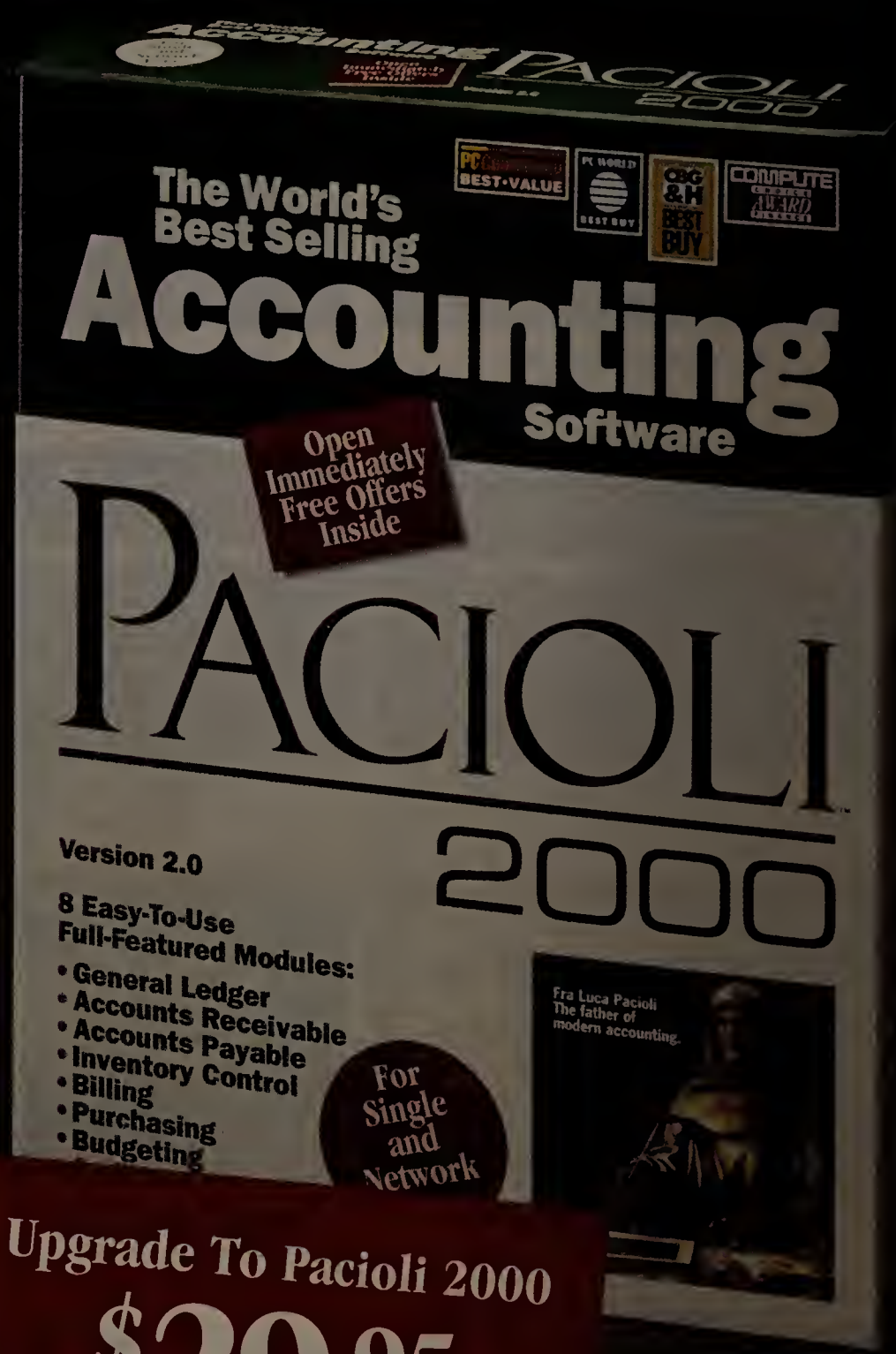

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PCWP2

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PC WORLD ADVISER

THE NETWORK DILEMMA

▶ *Everyone can benefit from a consultant, and in that spirit we offer the first installment of the PC World Adviser.*

▶ *To kick things off, we solicited a real-world business dilemma and presented it to selected members of our expert panel. Then we asked, If hired as a consultant for this job, what solution would you recommend?*

EDITED BY ROBERTA FURGER

DAVID FLAHERTY

Our panel's first challenge comes from David Crooks, vice president of software engineering at TechTrak International in Silver Spring, Maryland, who faces the situation every manager dreads. His company's president has directed him to research and oversee the installation of a local area network—a tricky subject, and one he knows virtually nothing about. In his words:

We're a brand-new software development company, so we'll be starting small, with an eight-PC network. By the end of our first year, however, we expect to have grown to 30 employees, and we want something flexible that can grow with us.

Initially we'll be using the network primarily for file sharing and shared access of our customer data base, written in *FoxPro*. We don't want to have six different versions of the same package in use, so we'll also run all our applications on the server. We plan to start with *Microsoft Excel 4.0*, *WordPerfect*, and *Windows 3.1*.

Other key requirements include shared peripherals, particularly printers and modems, and occasional E-mail. While we're still small, though, we'll probably use E-mail only to replace hard-copy memos.

Rather than buy all new hardware, we want to set up the network using what we already have: one 286/16, two 25-MHz 386s, two 16-MHz 386s, one 386/33, and two 386SX/20 notebooks, which belong to our sales staff.

We want something economical, low maintenance, and invisible to the end users, and we want to make sure we have plenty of room for growth.

Roberta Furger is an associate editor for PC World.

SOLUTION #1

SERVER-BASED LAN

Patrick Carrigan is managing director of The Carrigan Group, a Sausalito, California, company specializing in local area network planning, design, and disaster prevention and recovery. He also wrote a book on NetWare, "Building Local Area Networks With Novell's NetWare" (M&T Books, San Mateo, California, 1992).

PROS: *Room for growth, widely supported* **CONS:** *Pricier, more management intensive, complex installation* **COST:** *Approximate retail $5700*

Based on the applications you'll use, especially *FoxPro* for your customer data base, a full-blown network running NetWare offers the best advantage. Besides giving you room to grow, it supports key features that your business will need now and as it expands, such as transaction rollback, which protects data base files if the LAN crashes.

Your best bet is the 20-user version of NetWare 3.*x*, which offers a much better growth path than the older and less-capable NetWare 2.*x*. For the connection hardware, I'd suggest 10Base-T Ethernet. It's an excellent value and provides capability for growth.

You'll need parallel port adapters to hook the notebooks up to the network, such as those offered by Xircom or Accton. You'll also need to consider hard disk server requirements. I'd suggest at least a 600MB drive.

Although NetWare may seem like overkill at first, you're going to need the added capabilities as your company grows. Network management issues such as access rights, allocation of resources, and file backup and recovery become more important as your network grows. NetWare handles these issues in a much more straightforward way than peer-to-peer solutions do and gives you better performance as you place more demands on the network.

Every network, regardless of type or size, requires some level of management. With a peer-to-peer network, users can manage themselves, but that gets more and more cumbersome as the LAN begins to grow. As a start-up company, you're not going to want to devote a lot of time to the task, so I suggest training a staff person to act as part-time administrator. As your firm grows, though, you'll want to consider making it a full-time position.

As a peer-to-peer system grows, management becomes more complex and you will probably want to install a server-based system. You're better off starting out that way.

ERIC MILETTE

SOLUTION #2

LANTASTIC PEER-TO-PEER NETWORK

David Pujals is president and CEO of YIBM, a national, independent network consulting firm based in Burtonsville, Maryland. He's also the chairman of Artisoft's five-star advisory council, made up of authorized five-star dealers.

PROS: *Inexpensive, quick and easy installation, simpler management* **CONS:** *Security issues may be problematic as network expands* **COST:** *Approximate retail $2900*

Without a doubt, I'd suggest a peer-to-peer solution, which frees you from having to devote one computer to act as file server. With a peer-to-peer LAN, any system can be both a workstation and a server, and users can access resources wherever they reside on the network. As a start-up company, you don't have the resources for a network administrator, which is what you'd need with NetWare. A peer-to-peer approach offers the advantages of a server-based LAN but is practically invisible to the users.

Specifically, you should go with Artisoft's *LANtastic* 10-mbps Ethernet network. I'm suggesting the faster network (there's also a 2-mbps version) because *FoxPro* and *Excel 4.0* present a challenge to the network and can cause some I/O bottlenecks. The faster network will reduce the chance of timeouts and clumsy performance.

The two notebooks will hook into the network using Central Station connectivity processors—parallel port network adapters. Even when the notebooks aren't hooked into them, the stations can be used as print servers. And with the base unit, you'll get *LANtastic* and NetWare drivers and 6 feet of parallel cable.

I suggest having two servers, both of which will also function as workstations on the network. Your 386/33 will hold all the program and data files, and the 386/25 can run disk-to-disk mirror backup on main programs and files. For modem sharing, I'd recommend *ArtiCom* software by Artisoft.

This network is well suited to future growth. I've installed *LANtastic* networks with 100 users, so you won't be limited as you hire new staff and want to include them in the net. It's also the most user-friendly network, both in terms of file management and for tasks such as logging on to and off of other drives and printers. Users won't have to spend time dealing with networking issues; they can just concentrate on the task at hand. ■

KATHERINE LAMBERT

CHALLENGER'S CHOICE

After weighing the options, David Crooks chose Artisoft's *LANtastic* as the networking solution best suited to the needs—and budget—of start-up TechTrak International. "For our uses, *LANtastic* is a simpler solution; we won't need someone to manage the network," explains Crooks. "And at roughly half the price, it's much more affordable."

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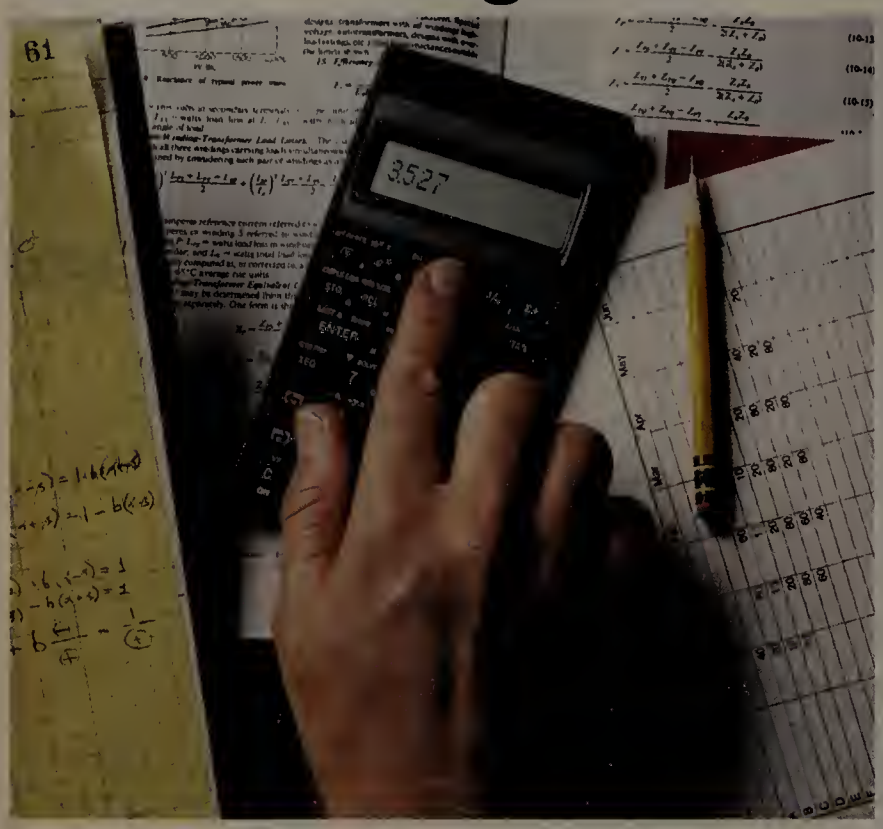

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Circle 151 on reader service card

PCW53

THE HELP SCREEN

BY KARL KOESSEL AND ROBERT LAURISTON

PC World offers answers and advice at every level

Q. *My PC powers up with Num Lock on. I'd like to change the default so Num Lock is off at start-up. I would greatly appreciate your help.*

PHILIP M. LINK
ARNOLD, MARYLAND

A. These days lots of PCs let you choose Num Lock's default status using CMOS setup utilities. If your system doesn't offer that option, you can easily create a utility to switch Num Lock off, then add the command to call that utility to AUTOEXEC.BAT so Num Lock is shut off automatically every time you start your PC. Using your word processor or a text editor, create a file called NLOCKOFF.SCR containing the lines in **FIGURE 1.** (If you use a word processor, be sure to save the file as text.) Then enter **DEBUG < NLOCKOFF.SCR** at the C> prompt to create NLOCKOFF.COM. You can also download NLOCKOFF-.COM from PC World Online.

```
A 100
MOV AX,40
MOV DS,AX
AND BYTE PTR [17],DF
INT 20
R CX
C
N NLOCKOFF.COM
W
Q
```

FIGURE 1: Use this text file of DEBUG keystrokes to create NLOCKOFF.COM, a program to turn off Num Lock.

ANTHONY RUSSO

Q. *I recently upgraded my old 286 by swapping the motherboard for a new 33-MHz 386 model, which included 4MB of SIMMs. In the 286, I had a memory board with 3MB configured as expanded memory for* Ventura *and some other programs. I mostly run* Windows *now, so I reconfigured the board's memory as extended and installed it in one of the new motherboard's slots for a total of 7MB of RAM. The memory counter slows significantly when it passes the 4096 mark (that is, when it starts counting the memory on the expansion board). Is this extra memory helping things, or would I be better off replacing it with more motherboard SIMMs?*

BRAD FEDERMAN
VIA PC WORLD ONLINE

A. It's the 8-MHz, 16-bit I/O bus that slows down your PC's use of the expansion board's memory. The 33-MHz, 32-bit memory bus connecting the motherboard memory to the CPU is theoretically eight times faster (although in practice the difference isn't quite that big). Certainly, with *Windows* or any multitasking environment, you can make good use of more fast memory, and SIMMs are quite inexpensive.

The real question is whether you should keep the old memory board. Any program that *Windows* loads into the expansion board's memory will run much more slowly than those using motherboard memory. In some circumstances, the board could even degrade overall system performance.

You could use the board's memory for a print spooler or RAM disk—after all, slow RAM is still faster than your hard disk. Some spooler and RAM-disk utilities will let you specify a starting address. If you want to use DOS's RAMDRIVE.SYS or SMARTDRV.SYS or some other utility that doesn't let you set a starting address, reconfigure the board as expanded memory and set the utility to use expanded instead of extended memory.

Alternatively, you could sell the board to someone still using a 286 and recoup the cost of the SIMMs.

Q. *I'm writing documentation for my company's on-line information system. Because I don't know how to put PC screen images into files, I'm capturing screens from a TeleVideo terminal and transferring them to my PC, where I then incorporate them into a word processing document. There's got to be an easier way.*

TOM GORE
HANOVER PARK, ILLINOIS

A. There are scores of commercial and shareware screen-capture utilities. However, you may already have a program with screen-capture capability. Do you use *Windows?* Just press <Print Screen> to capture the whole screen to the Clipboard, or <Alt>-<Print Screen> to capture the active window. If you run a DOS text-mode program full screen within *Windows*, pressing <Print Screen> copies the screen to the Clipboard as black-and-white text (in the Clipboard, select *Display • OEM Text* to set monospaced pitch). *WordPerfect* includes a memory-resident utility, GRAB.COM; however, it works only in graphics mode, and it sounds like your information system runs in text mode. (*WordPerfect Office* can capture text-mode screens—check the manual for the section about screen copy.) E-mail programs often include screen-capture util-

ities too—leaders *cc:Mail* and *Microsoft Mail* both do.

If you don't already have capture capability, or what you've got doesn't meet your needs, popular shareware utilities include *CAPBUF, GRABBER,* and *TXT2PCX*. You can find them on PC World Online, CompuServe, and other BBS's. Or you may want a commercial program; among the more popular of the 70 or so available are *Capture, Collage, DoDot, HiJaak, Hotshot Graphics, Pizazz Plus,* and *SnapPro.* Any large software vendor should stock a few of these.

Q. *I've heard there are tutorial programs that will teach you to touch-type. Do they work?*

BARBARA SWAN
SAN FRANCISCO

A. In our experience, they do. We've recommended such programs to several nontypists, all of whom now get more work done in less time.

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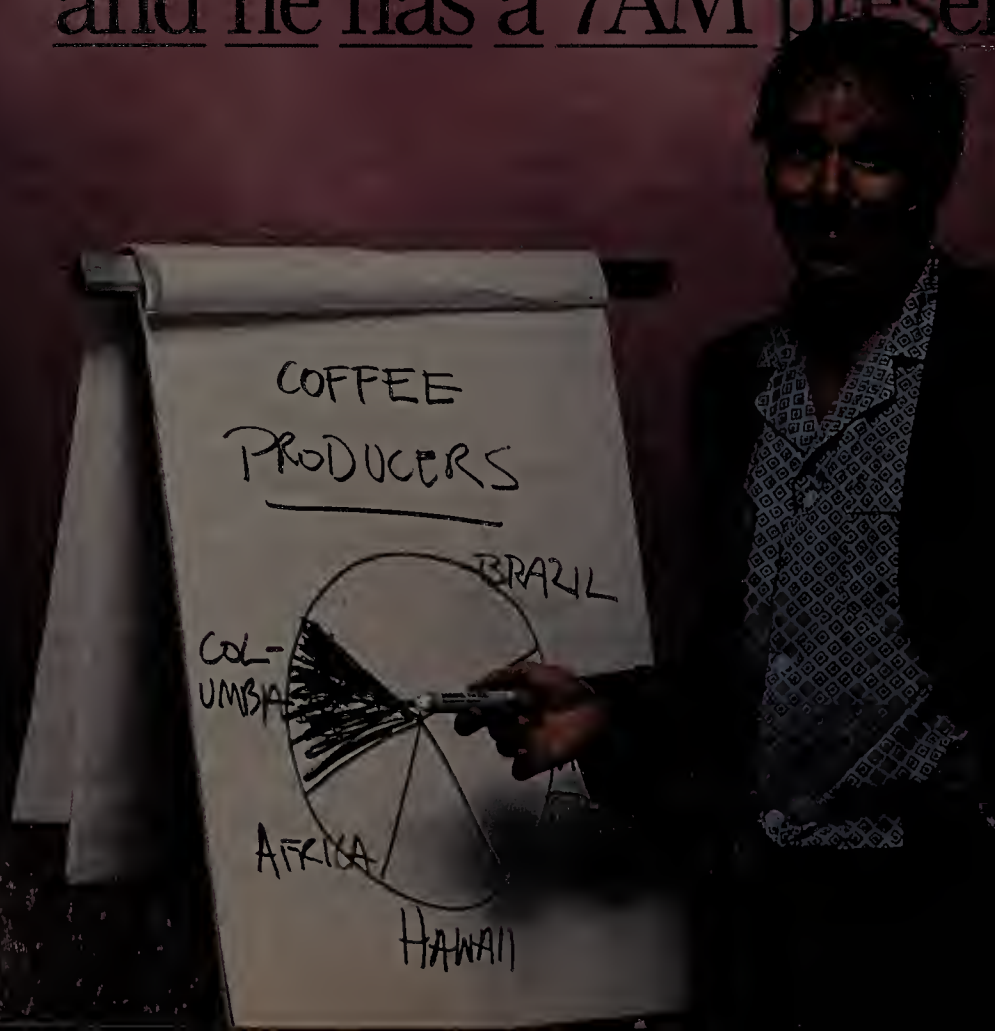
Q. *The listing WINMOUSE.BAT in your April column includes a couple of things I don't understand. What function do % and %% perform in a batch file? What does '%1*==%%A*' do?*

DONNA SUPAL
ST. CLAIR SHORES, MICHIGAN

A. The percent sign is used in batch files to signify replaceable parameters, replaceable variables, and environment

Jack Higgins has a small staff.
But that's small comfort if they're all
and he has a 7AM presentation



variables. You can use them collectively or individually to make your batch files more flexible.

You use replaceable parameters—%0 through %9—in a batch file to allow options to be passed to it. When a batch file executes, DOS substitutes the batch file's replaceable parameters with the parameters that you typed after the batch file's command—%1 is replaced by the first parameter, %2 by the second parameter, and so on (%0 is replaced by the name of the batch file). As an example, if EXAMPLE.BAT consists of the lines:

```
ECHO %3 is %0's 3rd parameter.
ECHO %1 is %0's 1st parameter.
```

and you issue the command EXAMPLE ONE TWO THREE, DOS will then display the following:

```
THREE is EXAMPLE's 3rd parameter.
ONE is EXAMPLE's 1st parameter.
```

You can string replaceable parameters to each other or to other characters in a batch file command, use them more than once and in any order, or not use them at all (as with %2).

One of the most common uses for replaceable parameters is to pass parameters to a program that a batch file runs. By placing such batch files in a directory listed in your PATH command, you can run the programs they call from any drive or directory without having to list each program's directory in your PATH. For example, Robert stores the file-archiving/compression program *PKZIP* and its related files in C:\UTIL\PK, which isn't listed in his PATH. In the directory C:\UTIL, which is in his PATH, he has the batch file ZIP.BAT, which consists of the single line **C:\UTIL\PK\PKZIP %1 %2 %3 %4 %5 %6 %7 %8 %9.**

Thus, Robert can run ZIP.BAT from any directory, and whatever parameters he types after the command ZIP are passed on to *PKZIP* in the same order.

A replaceable variable is a required part of the DOS command FOR. In a batch file, FOR's replaceable variable is specified by *%%character*, where *character* is any character except |, <, or >. (If you issue a FOR command from the DOS prompt, use one % instead of two.) FOR is used to perform an operation successively for each member of a set. For example, in DOS 5.0, the batch file command FOR %%A IN (C D E) DO DIR %%A:*.INI /S performs the command DIR C:*.INI /S first, then DIR D:*.INI /S, and finally DIR E:*.INI /S. The replaceable variable is successively replaced by each member of the set within the parentheses, and thus the command after DO is executed for each member of the set.

The WINMOUSE.BAT listing in April combines the use of replaceable parameters and replaceable variables. The line FOR %%A IN (Y y N n) DO IF %1*==%%A* GOTO OK simply checks whether WINMOUSE's first parameter (%1) was a member of the

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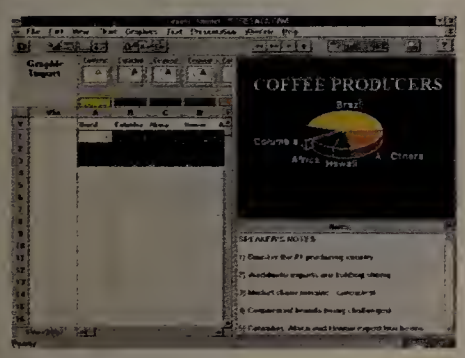

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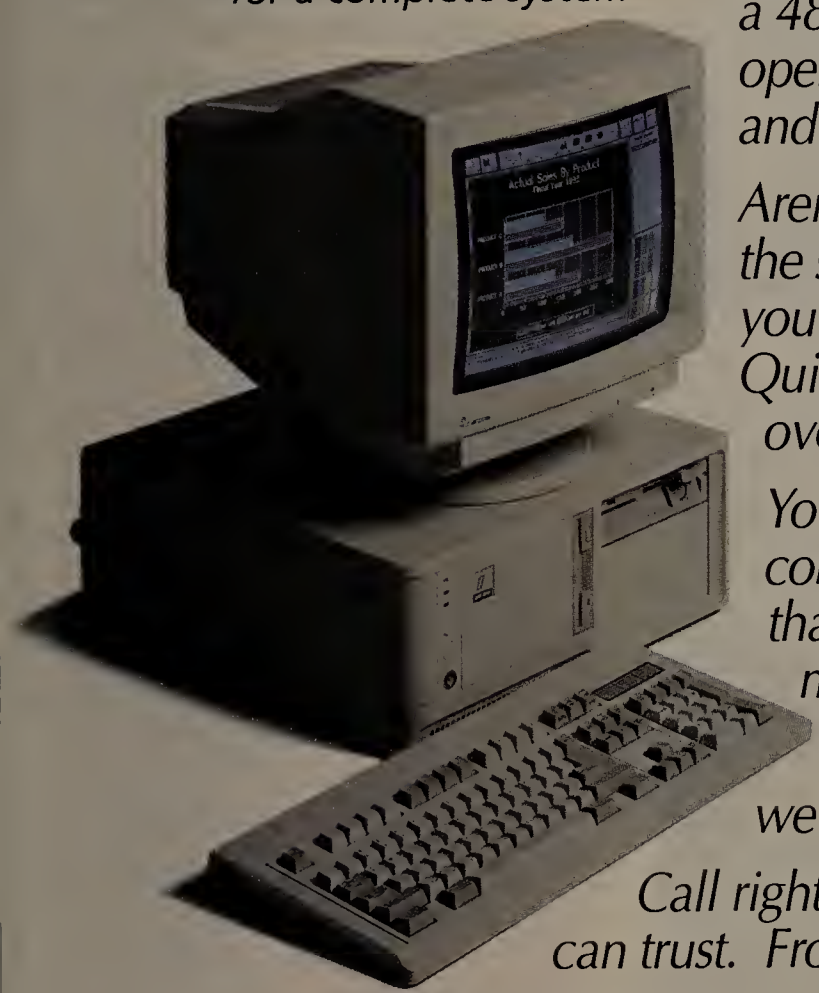

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specified set (Y y N n) and if so jumps over WINMOUSE's error message that would otherwise tell you that WINMOUSE must be followed by a Y or an N to run properly. The '*' (we could have used almost any character) on either side of the '==' ensures that the left side is not blank if no parameter is entered, which would generate an error halting the batch file.

Environment variables, which were not used in WINMOUSE.BAT, are specified in batch files by leading and trailing % signs. The batch file in this month's *Windows Workshop* column demonstrates the use of environment variables.

Q. *In the past few years my organization has installed a good number of Intel and Cyrix 387 coprocessors in our systems. These chips have always had speed ratings—16, 20, 25, or 33 MHz—but the manual that came with our*

POWER TIP NO. 259

Making the Grid With Microsoft Word 5.0

You can create a multicolumn Word 5.0 grid in a flash. Here's how to make one with four columns: With the cursor at the top left of your Word screen, press <**Enter**> twice and <**Tab**> once. Press <**Esc**>, type **FBB**, and hit <**Enter**>. Now press <**Esc**>**FTS** and set Vertical Tabs at **1.6, 3.2, 4.8,** and **6.0.** When you press <**Enter**>, a four-column grid will be displayed. Press <**Enter**> to extend the length of the grid. You can now set tabs (left, right, center, or decimal) inside the columns for either text or number entry.

Gregory P. Desvarieux
Brooklyn, New York

The Monitor for Windows

The ViewSonic 7 was the original, "Big Screen for Windows" monitor. Here's what some editors said about it:

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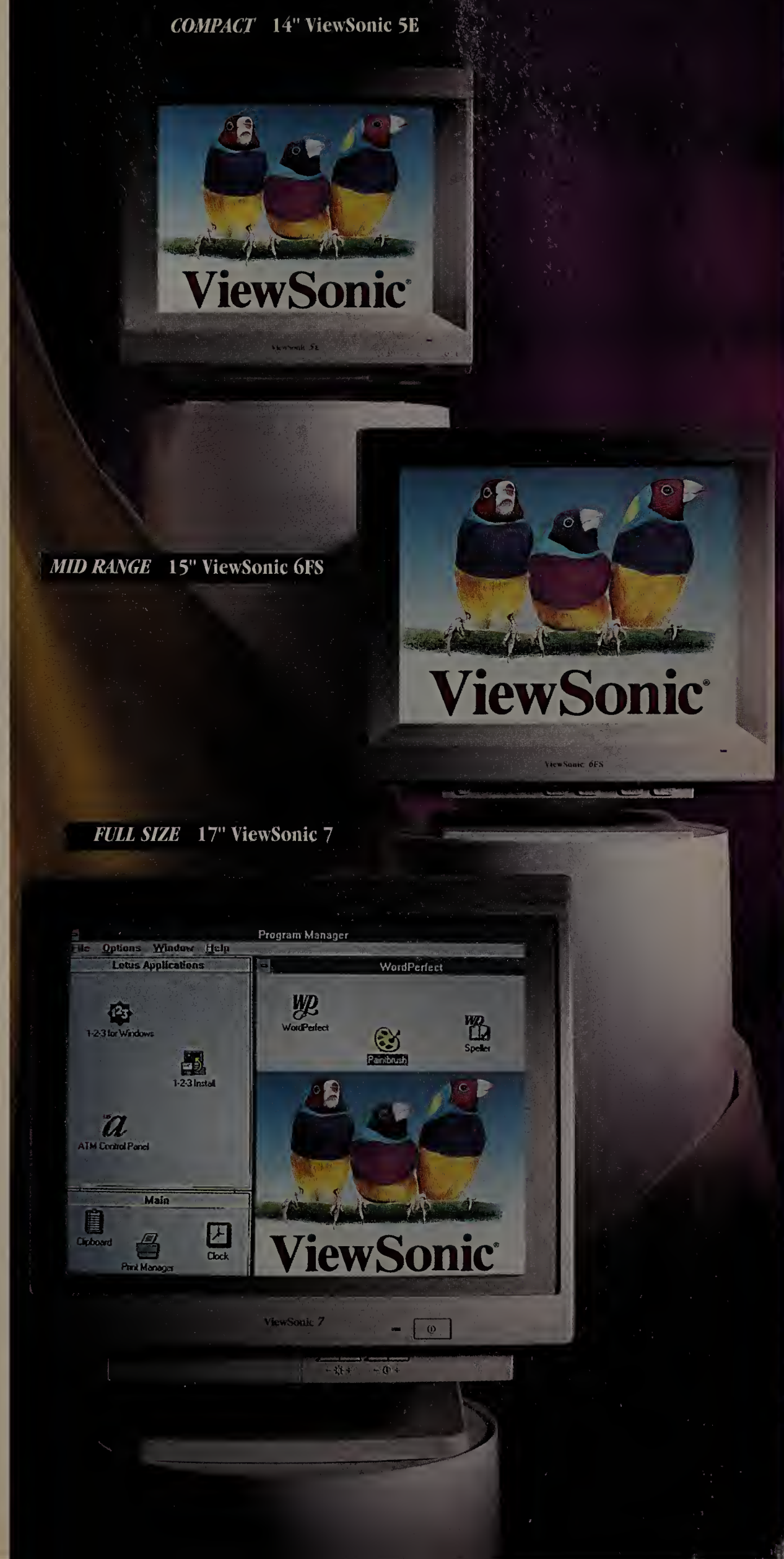

most recent shipment of Intel chips says that the i387DX will work with all 386DXs, regardless of their clock speed. Does that mean we would be able to plug one of our old 25-MHz math coprocessors into a 33-MHz system and obtain the same results?

SHU S. LIAO
MONTEREY, CALIFORNIA

A. No. If you put a 387 in a system faster than it's rated for, it may not work reliably, if at all. However, you can use a 387 in a system that's *slower* than the coprocessor's speed rating.

As indicated by your manual, Intel recently switched to a "one coprocessor fits all" approach. Now all the 387 chips it sells are rated at 33 MHz. The first such chips are marked A80387DX 16-33. Later ones have i387DX in big letters, with 80387DX 16-33 in small type underneath. Cyrix continues to sell a full range of speed-rated chips, including a 40-MHz version for systems using AMD's 40-MHz 386 clone, which Intel does not support.

Mail your questions to The Help Screen, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Help Screen; CompuServe, 75300,3205; MCI Mail, 381-7106; Internet, rlauriston@aol.com; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Karl Koessel is the technical editor and Robert Lauriston a contributing editor for PC World.

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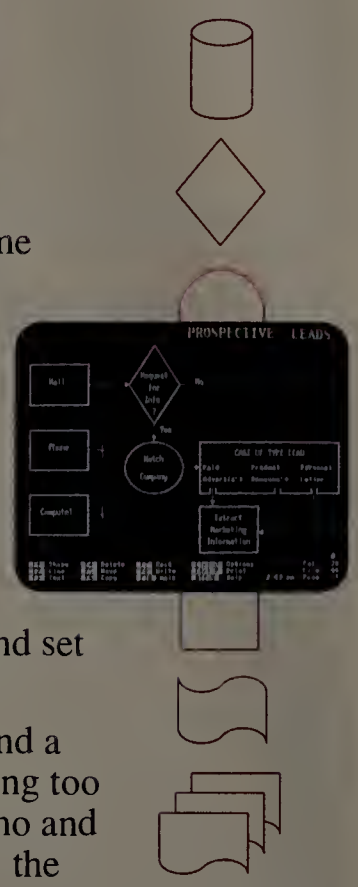

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POWER TIP NO. 260

Run a Word Macro Automatically at Start-Up

You can direct *Word 4.0* or *5.0* to execute a macro automatically every time you load the program. Any macro named **autoexec** will execute upon start-up. For example, to set up a macro that automatically displays a list of files, start *Word*, and press **<Shift>-<F3>** to begin recording a macro. Press **<Esc>tl<F1>** to display a list of files in the current directory. Then press **<Shift>-<F3>** again to end macro recording. At the 'Copy to' prompt, type **autoexec,** then press **<Enter>.** To save the macro in the current glossary file, press **<Esc>tgs<Enter>.**

George Campbell
Contributing Editor

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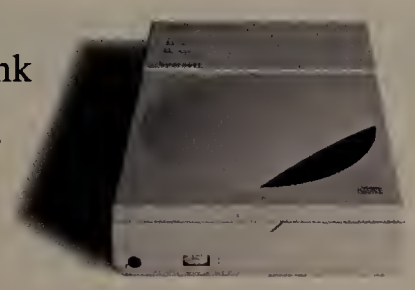

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SPREADSHEETS(A..Z)

BY RICHARD SCOVILLE

Practical tips for building better worksheets

One giant worksheet isn't always the best solution. Smaller files for different quarters, departments, or field offices are often easier to work with and certainly easier to pass around. But how do you bring all that information together in one sensible table? This month, in the second part of our *Excel* primer for *1-2-3* refugees, we'll take a look at the program's multifile operations, including its truly amazing automatic consolidation feature.

Here's the scenario: As manager of operations at the corporate office, you're responsible for assembling a budget that includes expense details from each of four districts. The district managers have all attended an introductory *Excel* class, so you decide to prepare a template for each district and have the managers fill in the blanks with their data. Then you'll retrieve the completed templates and consolidate them into a single summary worksheet.

The First Sheet

Let's begin with a simplified budget worksheet that has a column for each quarter of the year (for your typing convenience, we'll pretend that months aren't important). Using **FIGURE 1** as your guide, enter the labels and dummy values in row 1 and in the A2:G7 range. (If you're using *Excel 4.0,* you can copy a cell or range by simply dragging the fill handle to the bottom right corner of the highlight.) To help the district managers identify the data cells—so they won't be tempted to enter a value into a cell that already contains a formula—select D3:G7, then *Format•Font,* and change the text color to blue.

Next you must enter the formulas. In H3, type **=SUM(D3:G3)** (or double-click on the AutoSum button), then copy the formula into the range H3:H7. In D8, enter **=SUM(D3:D7)**, and copy it into E8:H8. For easy-to-read numbers, select D3:H8, execute *Format•Number,* and select the *#,##0* format. Use *File•Save* to save the file as BUDGBO.XLS.

A Sheet for Every District

Now we need worksheets for the Nashville, Raleigh, and Charlotte district managers. Press **<Shift>-<F11>** three times to create three new sheets. Getting these files to work together differs a bit from *Excel 3.0* to *4.0,* so only one of the next two paragraphs applies to you.

If you're using *Excel 3.0,* select *Window•Arrange All* to view all four sheets at once. Click in the BUDGBO sheet, then select *Window•Workgroup.* Select the entire worksheet by clicking on the top left corner of the frame, above the row numbers and left of the column letters. Execute *Edit•Fill Workgroup,* click *All* in the dialog box, then click *OK; Excel* will copy everything in BUDGBO into the three new sheets.

If you're using *Excel 4.0,* select *Window•Arrange,* make sure that 'Tiled' is selected, and click *OK.* This will show you all four sheets at once. Click in the BUDGBO sheet, then select *Options•Group Edit* and click *OK.* Select the entire worksheet by clicking on the top left corner of the frame, above the row numbers and left of the column letters. Execute *Edit•Fill Group,* click *All* in the dialog box, then click *OK; Excel* will copy everything in BUDGBO into the three new sheets.

Now that the sheets all look the same, it's time to make them look different. Go to cell A2 in any one of the unnamed sheets, and replace 'Greensboro' with the label **Nashville.** In the other two files, replace the label with **Raleigh** and **Charlotte.** Your screen should now resemble **FIGURE 2,** although the menus and icons will look different if you're using *Excel 3.0.*

Before you go on, press **<Ctrl>-<F10>** to zoom the current file (it doesn't matter which) to a full-screen window; you can cycle through the full-screen work-

BUDGBO.XLS

	A	B	C	D	E	F	G	H
1		Expense	GL-No.	Q1	Q2	Q3	Q4	Year
2	Greensboro							
3		Salaries	102	10,000	10,000	10,000	10,000	40,000
4		Supplies	230	1,000	1,000	1,000	1,000	4,000
5		Equipment	250	1,000	1,000	1,000	1,000	4,000
6		Lease Pmts	780	1,000	1,000	1,000	1,000	4,000
7		Advertising	875	1,000	1,000	1,000	1,000	4,000
8				14,000	14,000	14,000	14,000	56,000
9								

FIGURE 1: A basic budget template with dummy data values makes your formulas easy to check; you can quickly see if four 1000 values don't add up properly.

ANTHONY RUSSO

Spreadsheet Toolbox

PREDICTING SUCCESS

Trying to foretell the future? If you don't have a crystal ball, you can buy a dedicated forecasting package (see "Forecasting Software," July 1992) or check out a forecasting utility such as *Geneva*.

This $495 add-in for *1-2-3 3.1* has heavy-duty forecasting power for marketing, inventory management, and many other applications. *Geneva* automatically selects the best forecasting method to fit your data. Even the statistically inept can make sophisticated predictions, while advanced users can still control the forecast method. Using *Geneva* is straightforward, and it can perform forecasts on hundreds of data series at once. *Geneva* has its flaws—it won't accept range names to identify data—but considering its power and versatility, I predict you'll like this program.

Geneva Statistical Forecasting $495; Pizzano & Company, Inc., 800 W. Cummings Park, Woburn, MA 01801; 617/935-7122, 617/935-4473 (fax)
Reader service no. 664

sheets by pressing <Ctrl>-<F6>. To aid in consolidating the district budgets later, name the range that contains the budget data: In each sheet, select B3:H7 and execute the command *Formula•Define Name*, enter **BUD_DATA**, and then press **Enter**. Save the unnamed files with file names that will remind you of their content: BUDNASH, BUDRAL, and BUDCHL.

Getting It All Together

In our scenario, it's now time to circulate the templates so region managers can fill in their data; but since you're in this alone, you'll have to do it yourself.

Select each file in turn, and enter fictitious data to reflect each individual district. Because some districts may have expense categories that don't appear in your template—travel, for instance—insert additional rows in one or two of the worksheets: Click on a row number between 3 and 7 and select *Edit•Insert*. Then fill in the expense category, a general ledger number, an item, and some values; copy the formula in column H with **<Ctrl>-<Apostrophe>**. Save each sheet as you go.

When the data files "return from the districts," you're ready to consolidate them to show the total amount budgeted for each expense item. Press **<Shift>-<F11>** to create a new worksheet, then copy the column headings from one of the district sheets: In any one of them, select the range B1:H1, and then press **<Ctrl>-<Insert>**. Then go to the new worksheet, select cell A1, and press **<Shift>-<Insert>**.

Now you're ready to consolidate the detail sheets. Place the cell pointer on A2 in the new worksheet and select *Data•Consolidate*. In the resulting dialog box, click in the Left Column check box because you'll need to match the entries from each detail file according to the labels in column B—the leftmost column in BUD_DATA. Click in the Reference box, enter **BUDGBO.XLS!BUD_DATA**, then click on *Add;* the range name will appear on the All References list. Use the same procedure for BUDRAL-.XLS!BUD_DATA, BUDNASH.XLS!-BUD_DATA, and BUDCHL.XLS!-BUD_DATA as references. Finally, click on the Create Links to Source Data check box, and then click *OK*.

Excel will then build linked formulas to the values in the regional worksheets' data cells. Matching by Expense Item, it will total the values for each column and organize the results into a two-level outline. To expand the outline, click *2* at the top of the outline area, which is just left of the worksheet frame. For an example of how *Excel* has linked the worksheets, examine the formula in D2:

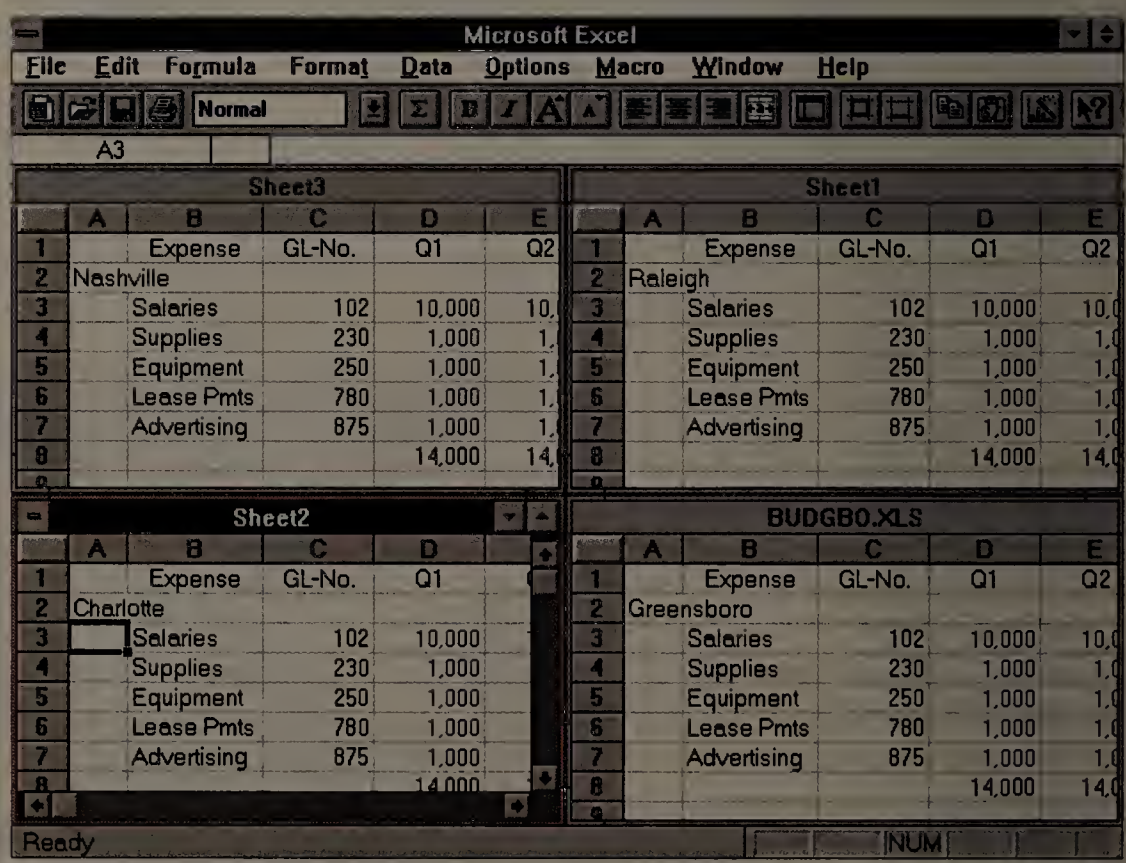

FIGURE 2: Excel's Fill WorkGroup command lets you easily duplicate aspects of one worksheet in others—for example, to create budget worksheets for various sales regions.

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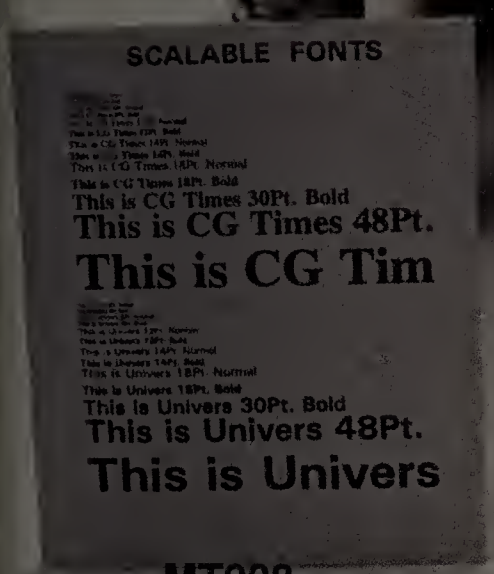
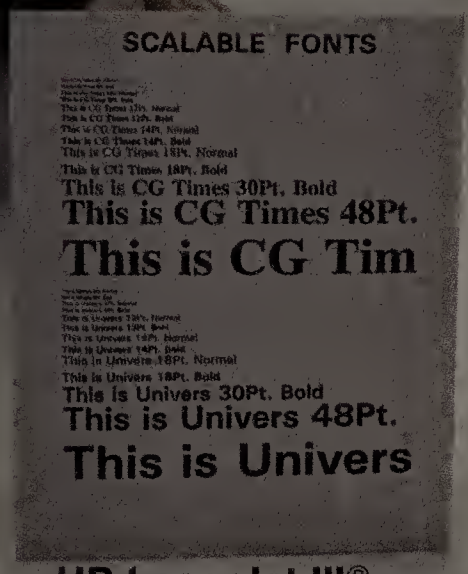


MT908



HP LaserJet III®

Okay, here's a hint. The market leading laser printer features HP® PCL5 printer control language. The MT908 laser printer from Mannesmann Tally is PCL5 compatible, as well. Oops. The market leader provides 8 scalable fonts. The MT908 gives you the same scalable fonts. Hmm. The market leader offers a feature for smoother edges on fonts and graphics. The MT908 has Edge Enhanced Technology (EET®) for the same effect.

Alright. What about performance? The market leader prints at 8 pages per minute and includes the processing power of the Motorola 68000. The MT908 prints at 8 pages per minute but provides 2.5 times faster processing of scaled fonts and graphics with its Intel i80960 RISC processor. Now we're getting somewhere.

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Bottom line: the Mannesmann Tally MT908 gives you all the features of the market leader with faster processing for faster throughput, better paper handling and has a list price of only $1,995... $400 less than the market leader*.

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So any way you figure, the answer comes up the same. The MT908 looks better, and so does the price.

For the name of your nearest dealer call:

1-800-843-1347 Ext: 470

Mannesmann Tally Corporation
Kent, Washington

*Based on HP LaserJet III suggested list price of $2,395
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Circle 161 on reader service card

Excel Shortcut

NAMING AFTERTHOUGHTS

by Ralph Soucie

We all know that we should name our ranges when we first build a worksheet. A formula such as '=Annual_budget-Salary' is much easier to read than '=B15-B27'. But we seldom bother to name the cells when we first set up a worksheet. We're rushed, and we can always go back and clean things up later, right?

You probably already know that naming a group of one-cell ranges is pretty easy, especially if you've placed identifying labels to the left of your values. The technique varies slightly between *Excel 3.0* and *4.0*, but in either case use the *Formula•Create Names* command and accept the option to take the names from the left column. But what if you've already referred to the newly named ranges by cell address elsewhere in the worksheet? Is there any way to change all cell address references to named range references?

Would I be asking you this if there weren't an answer? Select the range(s) that contain references to the newly named ranges, then choose *Formula•Apply Names*. With all of your range names highlighted (the default), click *OK*. *Excel* will replace the cell addresses with their range names, making your worksheet more comprehensible and better documented.

=BUDCHL.XLS!D3 reflects the salary value in cell D3 of BUDCHL.XLS.

But what about column C? The consolidation routine has mistakenly totaled the General Ledger numbers! To clean up the sheet, copy the values from the cells above the incorrectly summed ones: While the outline is collapsed, select C6 and press **<Ctrl>-<Apostrophe><Enter>**. This will copy the contents of cell C5, the correct General Ledger number, into C6. Repeat the process with other formulas in column C.

Excel's multifile capabilities, including the capability to view several files in sizable windows at once, makes work group applications like this budget example a breeze.

Q. *I want to use* Quattro Pro 3.0 *to keep year-to-date totals. I'd like to enter a new number; add it to existing YTD figures, then store the new totals in place of the old. The trouble is, I can't figure out how to store the result of a formula in another cell. It appears that I must keep the data from each day and have a formula that adds them; this makes for a very big spreadsheet.*

MICHAEL HARRISON
BENSALEM, PENNSYLVANIA

A. You need to use the Edit•Values command, which, in contrast to the usual Edit•Copy command, copies the value of a formula instead of the formula itself. Below is a simplified version of your problem:

	A	B
1	New value	100
2	Previous total	1000
3	Year to date	1100

Cell B3 contains a formula, @SUM(B1..B2), showing the results just after you've entered today's value. To prepare for tomorrow's value, put the cell pointer on B3, select */Edit•Values*, press **<Enter>** to select B3, then put the cell pointer on B2 and press **<Enter>** again. The Previous total is now 1100, and you're ready for a new value in B1.

Mail your spreadsheet questions to Spreadsheets (A..Z), PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Spreadsheets (A..Z); CompuServe, 72341,2727; MCI Mail, 357-4517; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Richard Scoville and Ralph Soucie are contributing editors for PC World.

POWER TIP NO. 261

COMMAND.COM in Windows 3.1

The Run command in *Windows 3.1* File Manager is a decent command line, but if it understood internal DOS commands, it would be a better one. In a directory that's listed in your AUTOEXEC.BAT's PATH command, create a one-line text file called C.BAT: **%1 %2 %3 %4 %5 %6 %7 %8 %9.** Once that's done, you can run any internal DOS command from File Manager's Run box, simply by preceding it with a C and a space. For instance, to copy all drive B:'s files to File Manager's current directory, enter **C COPY B:*.*.** One warning: If you use C.BAT from Program Manager's Run command, you won't know which directory your commands are acting upon.

Lincoln Spector
Associate Editor

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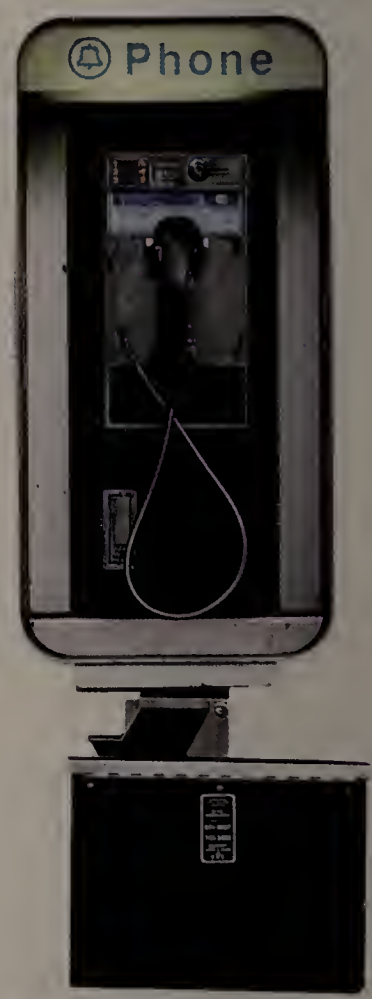

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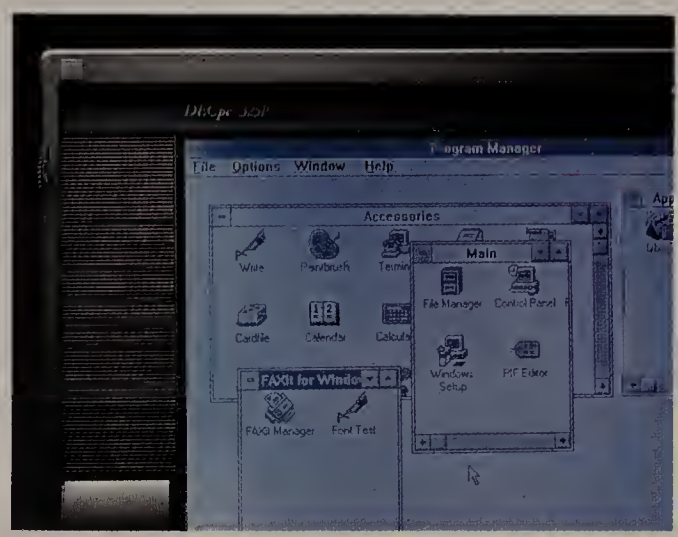

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Print Modes:	Portrait and landscape
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WORD PROCESSING CLINIC

BY GEORGE CAMPBELL

Tips for getting the most out of your word processor

Q. *I often import ASCII files into* WordPerfect 5.1, *but I'm frustrated at how long it takes. I press <Shift>-<F10><F5><Enter> to view a list of files, highlight the one I want, and press R to retrieve the file. The import seems to take forever. Is there a faster way to import files?*

DALLMAN ROSS
OAKLAND, CALIFORNIA

A. Here's a simple trick that will speed up your imports dramatically. Instead of pressing R after highlighting the file you want to import, press **<Ctrl>-<F5>**. You'll notice, however, that *WordPerfect* doesn't automatically reformat margins. If you want to reformat them, press **<Page Down><Page Up>** after importing your text.

Q. *I like to see the carriage returns in my* WordPerfect 5.1 *documents, but I hate using the <Alt>-<F3> Reveal Codes window because it takes up so much screen space. Is there a way to display some kind of character to show where I've pressed a carriage return?*

TERRY SNOW
LAYTON, UTAH

A. *WordPerfect* does let you see what it calls "hard" returns, but the feature you're after is buried three menus deep in the program. Try pressing **<Shift>-<F1>DEH<Ctrl>-A<F7>**. You'll see a small, solid box wherever there's a hard return. This display becomes the default until you turn the feature off by pressing **<Shift>-<F1>DEH<Ctrl>-J<F7>**.

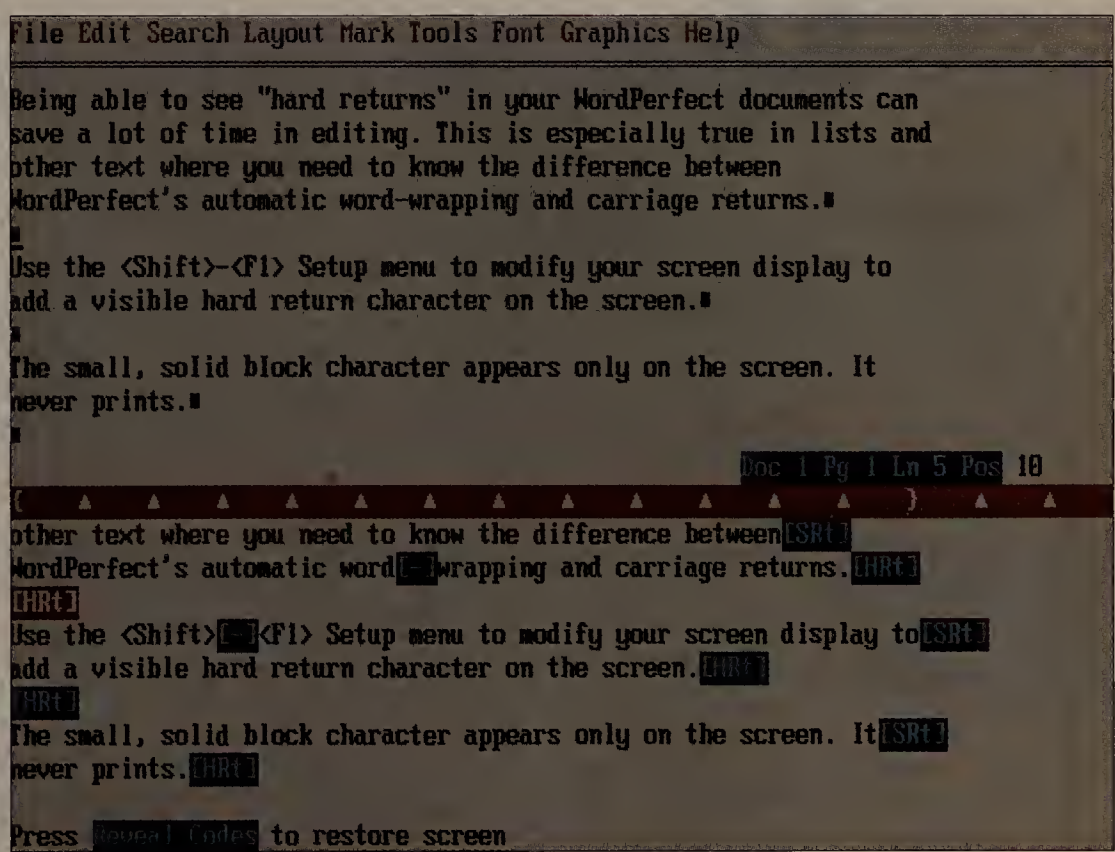
Q. *I use* Word 5.5 *and other DOS programs to create documents in both Spanish and English. I switch to the Spanish keyboard by using the DOS command KEYB SP. But then I can't type a backslash, so I can't change directories while in* Word—*or worse—at the DOS command line. Is there a solution for this?*

CARLOS LOPEZ
ATHERTON, CALIFORNIA

A. Whenever you need more than just a few characters in a foreign language, using the DOS command KEYB can speed your work. In addition to redefining characters produced by normal and shifted keys, KEYB redefines the *right* <Alt> key of enhanced keyboards, which allows keys to have a third character. In the Spanish layout, you hold down the right <Alt> key and tap the open single quote key (it's located to the left of the 1) to type a backslash. On standard keyboards, which have only one <Alt> key, hold down <Ctrl> and <Alt> and press the open single quote key (').

You can also simply revert to the United States layout from any foreign language layout by pressing **<Ctrl>-<Alt>-<F1>** (use the left <Alt> key). To get back to the foreign layout, use **<Ctrl>-<Alt>-<F2>**. Switching between layouts may be the easier alternative, since you can see the character you want on its key. In fact, if you don't have a foreign language keyboard, which adds a key between the left <Shift> key and the Z, you must revert to the United States layout to type the characters KEYB defines for that key, such as < and > in the Spanish layout.

And finally, from any layout, you



If you like to see your carriage returns in WordPerfect but hate depending on the Reveal Codes window, add a character to represent carriage returns.

ANTHONY RUSSO

should be able to hold down the left <Alt> key and type 92 on the numeric keypad to produce a backslash.

Q. *I just switched from* WordPerfect 5.1 *to* Word for Windows 2.0. *I've always used* WordPerfect's *<F4> (indent) command to create paragraphs with a hanging indentation. In* WinWord, *I can't seem to find an equivalent command. Can* WinWord *do this?*

DAVID J. LUMSDEN
HANOVER, ONTARIO, CANADA

A. Sure. Creating hanging indents is as easy to do in *WinWord* as it is in *WordPerfect*. Before beginning a paragraph or after moving the cursor inside an existing paragraph, try pressing <Ctrl>-T. That will align all the lines but the first one with the first tab stop. When you need a different indentation, simply drag the first tab marker on *WinWord*'s ruler to a new location. The keyboard shortcut for canceling hanging indents is <Ctrl>-G.

Q. *When I installed* Word for Windows 2.0, *I typed my name wrong. Now I'm reminded of my error each time I start* WinWord. *Is there any way to correct this typo?*

JAMES M. SCOTT
WHEATON, ILLINOIS

A. Ever since copy protection went out of style, many publishers—including Microsoft—have begun asking users to provide their name and business name when they install software. This information is written in an encrypted format in the WINWORD.INF file on the first installation disk and in the WINWORD directory on your hard disk. Your name shows up when you start *WinWord* in order to discourage people from making illegal copies. You can't change it at all.

Still, there's hope. If your system has two sizes of floppy drives and you installed your copy of *Word for Windows* from one set of disks in the package, you can reinstall the program from the other set and get another chance to enter your name. Also, if you created a set of backup installation disks before you installed the program, you can reinstall from the unused disks—after you've made backups of them, of course. If these options aren't available and you've registered your copy of *WinWord*, you can always wait until the next upgrade rolls around and fix the problem then.

Mail your word processing questions to Word Processing Clinic, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Word Processing Clinic; CompuServe, 71571,222; MCI Mail, GCAMPBELL; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

George Campbell is a contributing editor for PC World.

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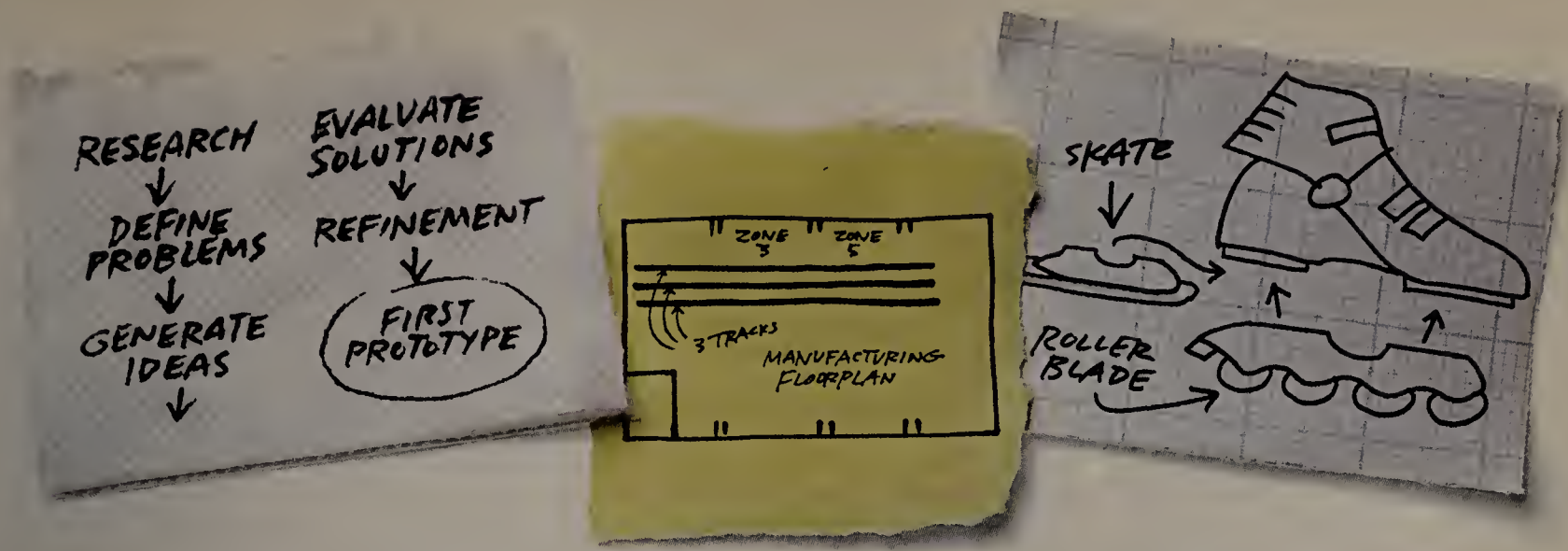

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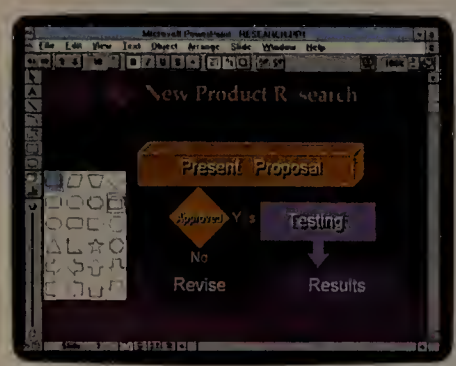

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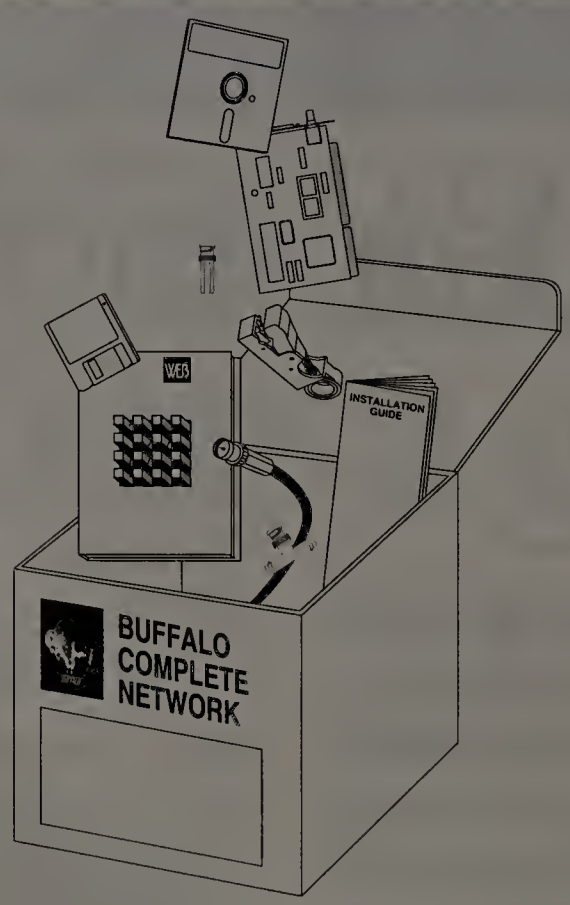

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DATA BASICS

BY CELESTE ROBINSON

Tips and techniques for managing your data

Q. *I use* Q&A *to track membership information for my organic gardening club, and sometimes I want to print all the records that meet one or more of a set of criteria. For instance, I use separate yes/no fields to mark whether or not members grow a particular kind of plant. It's easy to get a report of everyone who grows vegetables, or everyone who grows edible flowers, or everyone who grows vegetables and edible flowers. But how do I report on everyone who grows vegetables* or *edible flowers? Do I have to print out two reports and somehow combine them?*

DAVE MCCLEARY
RALEIGH, NORTH CAROLINA

A. You can change your Search Options in *Q&A* to have the program retrieve records that satisfy the search criteria you specify. When you're at the Retrieve Spec screen, prior to printing your report, press **<Ctrl>-<F7>**. This hot key, which isn't listed at the bottom of the screen as it should be, displays the Search Options dialog box.

The Search Options dialog box contains a highlighted sentence that reads: 'Select those records which DO meet ALL of the restrictions'. This default setting instructs *Q&A* to select only records that satisfy all the restrictions that you enter in the Retrieve Spec screen. To print records that satisfy any of the restrictions, select the unhighlighted word *ANY*, which will change the sentence to 'Select those records which DO meet ANY of the restrictions' (there's also an option for changing the DO to DO NOT, but you don't have to worry about that right now). Press **<F9>** to return to the Retrieve Spec screen. After you've entered your specifications, including the appropriate marks in your vegetable and flower fields, your report will yield both types of gardeners.

Q. *I use* dBASE IV *to enter invoice information for my electronics parts store. After entering the information, I exit editing mode and print out an invoice (which is set up as a report) for the record that I have just entered. I then go back into editing mode to enter the next invoice. Do you know of a way to automate this process to save some keystrokes?*

LEO OSWALD
LINCOLN, NEBRASKA

A. Yes, you can use a program like the one in **LISTING 1** to save yourself some typing. You can create the program in any text editor, or bring up *dBASE*'s editor either by selecting *Application•<create>* from the Control Center or by using the command **MODIFY COMMAND invoices** at the dot prompt.

You will have to change the program a bit to fit your own data base. On the second line, replace the word 'invoice' with the name of your data file. On the sixth line (not counting the blank one), replace 'invpnt' with the name of your report file.

To run the program, either select it from the Control Center's Application panel or type **do invoices** at the dot prompt. You should then see your INVOICES data base displayed in editing mode. To print an invoice for the current record, just press **<F5>**. Press **<Page Up>** to return to editing mode.

Q. *I created a report in* Paradox *that shows our sales by product type. Everything about it works fine except for the "percent of total" field. I can't figure out how to make this come out right. If I use a calculated field with an expression like SUM([Amount],GROUP)/SUM([Amount])*100,* Paradox *gives me inaccurate results. How can I get this field to work?*

CHRIS TOWNSEND
HIGHLAND PARK, ILLINOIS

A. For *Paradox* to give you an accurate percent of total in a report, you must first get a total for the program to work with. I'll show you two ways to do this. The first, simpler way requires *Paradox 3.5* or higher; the second, less elegant way works with all versions. Both assume that the table you are reporting on is called Sales and that the field you're calculating on is Amount. You'll have to alter the table and field names in the examples below to match your own data.

```
ON KEY LABEL F5 DO INVRPT
USE invoice
EDIT

PROCEDURE Invrpt
CurRec = RECNO()
REPORT FORM invpnt FOR;
 RECNO() = CurRec TO PRINTER
GOTO CurRec
RETURN
```

LISTING 1: This dBASE IV program prints a one-record report when you press <F5> while editing.

ANTHONY RUSSO

If you have *Paradox 3.5,* you can use a variable to hold the total sales. First, change your calculated field's expression to **SUM([Amount],GROUP)/Totsales*100**. Every time you want to run the report, you'll first have to assign a value to the Totsales variable. To accomplish that, press **<Alt>-<F10>** to display the PAL menu, select *Miniscript,* type **Totsales = CSUM("Sales","Amount")**, and press **<Enter>**. When you run your report after you have run this command, *Paradox 3.5* will use the value of Totsales—i.e., an accurate total—in the calculated field and print your percent of total field correctly.

If running this command each time you print seems tedious, you can automate the process by using *Scripts•Editor•Write* to create a short script called PRINTAVG.SC:

```
Totsales = CSUM("Sales","Amount")
REPORT "Sales" "R"
```

To run this script and print your report, press **<Alt>-<F10>**, select *Play,* type **PRINTAVG**, and press **<Enter>**.

If you're using an earlier version of *Paradox* that doesn't support variables, you'll have to add a Total field to your table: First, restructure your report table and add a number field called Total. Next, in your report, change the expression in your calculated field to **SUM([Amount],GROUP)/[Total]*100**. Finally, play this script every time you need to print your report:

```
COEDIT "Sales"
SCAN
[Total] = CSUM("Sales","Amount")
ENDSCAN
DO_IT!
REPORT "Sales" "R"
```

Mail your questions to Data Basics, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Data Basics; CompuServe, 74055,412; MCI Mail, 179-3813; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Celeste Robinson is a contributing editor for PC World.

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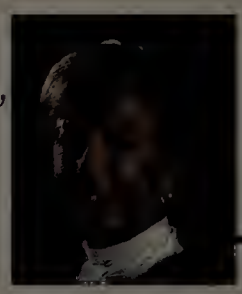

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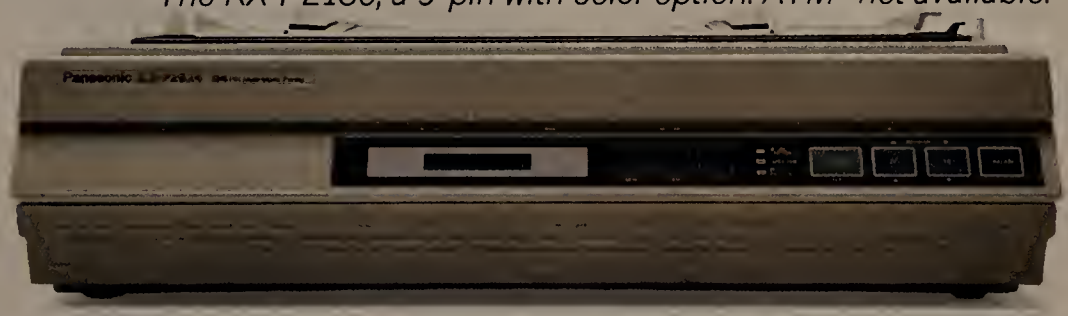

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PUBLISHING & PRESENTATIONS

BY RICHARD JANTZ

Expert advice for creating high-impact documents and presentations

To be successful in business, you not only have to identify your market and advertise your offerings, you must also define yourself. How well do your printed materials depict who you are? And how well do they convince people to do business with you? Considering the truckload of promotional mailers and other unsolicited materials every business person receives each week, it's certain that your company, products, and services will get passed by if your documents don't stand out.

For this month's make-over, we selected a promotional mailer from Dynamic Business Systems (DBS), a New York–based consulting company that specializes in computer hardware and software technology. DBS sends this two-sided, two-color, letter-size mailer to thousands of local businesses in order to advertise its services and promote business. To produce its documents, DBS primarily uses *WordPerfect* and *DrawPerfect*.

This document lacks a strong company identity: The letterhead information, including the company name, address, motto, and graphic, is hampered by an unappealing design that fails to set the company apart. Although the graphics and spot color attempt to enliven the material, the document still looks cluttered and unfocused: Too much of the text extends all the way from the left margin to the right margin, elements printed in spot color compete with each other, and the combination of a one- and two-column layout is confusing.

Our aim in the redesign was twofold: Create a stronger, more cohesive company identity, and make the document easier to read. A practical solution to both problems was to orient the letterhead information vertically, which created plenty of white space for easier reading. We also added a much-needed company logo (DBS) and placed all letterhead information inside a box to form a unified presentation of the company's identity. Separating the leftover space from the company letterhead makes it easier and faster to read the remaining text. We also replaced the clip-art computers in the original with one strong graphic that reinforces the document's message.

Best of all, DBS can also use the vertically oriented letterhead design as the basis for its business correspondence, price lists, invoices, news bulletins, and other materials. Using the same basic design helps promote a consistent image, reinforcing the perception that your company is important and successful in the business world.

Mail your publishing and presentation questions to Publishing & Presentations, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Publishing & Presentations; CompuServe, 7405,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Contributing Editor Richard Jantz is a computer publishing consultant in Berkeley, California. Larry Westdal, a graphic designer with Westdal Design Associates in Berkeley, also contributed to this article.

1 In the original, the company name and motto compete for attention. By adding a conspicuous logo using the company's initials and printed in spot color, we clearly identify the company. We used Corel Draw to create the logo and chose an authoritative-looking typeface: extra bold 60-point Helvetica Black.

2 Unifying company address and telephone/fax information under the logo helps solidify the company's identity and also makes it easier to find the numbers. The typeface is 10-point Helvetica Condensed Bold.

3 Surrounded by plenty of white space, the company motto is more compelling than it was in the original. We printed it in spot color to unite it with the logo. We also replaced the original 18-point Garamond Bold Italic with 14-point Helvetica Condensed Bold uppercase.

4 The subheads remain 18-point Garamond, but to make the copy look less busy, we eliminated the extra letter spacing and horizontal rules used in the original.

5 We improved readability by enlarging the original 10-point Garamond body copy to 11 points and increasing the leading from 12 to 13 points. We edited the copy to sharpen the document's focus and reduce the amount of text.

6 A simple, single-column format replaces the busy one- and two-column layout of the original. To help draw readers into the material, the first paragraph is set in 12-point Garamond with 14-point leading, slightly larger than the body copy.

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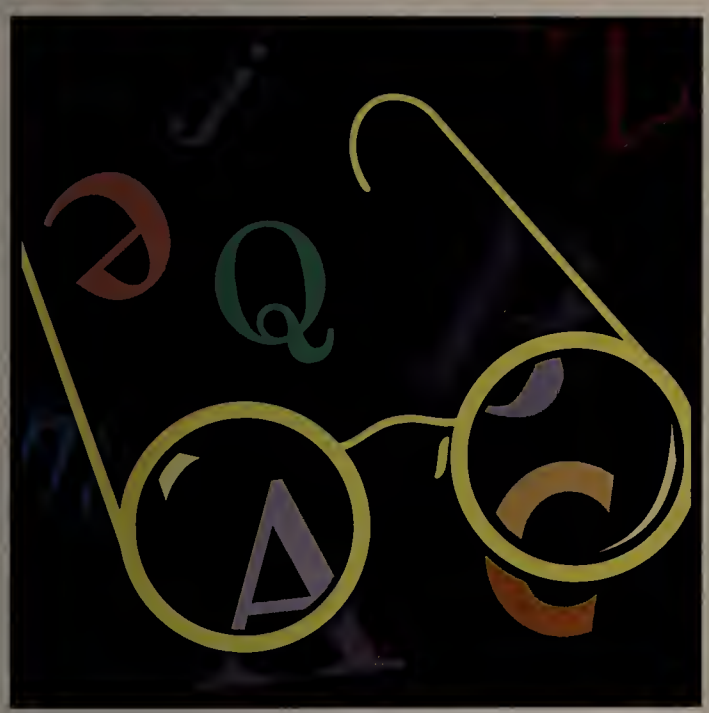

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COMMUNICATIONS Q&A

BY JUDY HEIM

On-line resources for business and professional users

Q. *I was using my fax-modem to communicate regularly with on-line services. Then I sent a fax with it. Afterward the modem would no longer work with any of my communications software. What's going on?*

CHARLES MADISON
TULSA, OKLAHOMA

A. *PC World* contributing editor George Campbell responded with a solution to this problem after Mr. Madison posted this question on PC World On-line. Often special communications software, such as fax software, will change a modem's internal settings and fail to change them back.

You can return a modem to its default settings by issuing the modem command ATZ. Do this by inserting the letter **Z** immediately after the 'AT' that begins your modem's initialization string—the string that your communications software sends to the modem when you fire up the software. You can find the string in the software's modem setting screen. In *Procomm Plus,* call up the setup screen by pressing **<Alt>-S**, and choose *Modem Options,* then *Modem Commands.*

If you use more than one communications program, insert the command in the initialization strings for all of your packages.

Q. *Some on-line services advertise that they offer dual-standard modems. What do they mean?*

JOSEPH MALY
AMSTERDAM, NEW YORK

A. Back in the early days of 9600-bps modems, every modem manufacturer built its high-speed modems with a different transmission scheme, and no two brands of 9600-bps modems could talk to each other. As usually happens in such situations, two preferred standards emerged from the chaos: U.S. Robotics's modulation scheme, a populist favorite on BBS's; and V.32, the modulation standard conceived by the CCITT. The CCITT is the telecommunications industry's international standard-setting body, a distant arm of the United Nations that's charged with the near-impossible chore of preventing the telecommunications world from periodically reverting to a Tower of Babel.

When an on-line service says it has dual-standard modems, it means that you can connect to the service at 9600 bps using either a U.S. Robotics modem or one of the many high-speed modems from other manufacturers that use the V.32 standard. However, if you have a 9600-bps modem that you purchased more than a couple years ago—such as an early Hayes V-series—chances are it doesn't support either of these standards, and you won't be able to connect at 9600 bps. There are still a few 9600-bps modems being sold that support neither the V.32 nor the U.S. Robotics standards, so check this out before you buy. If you're drawn to one of these nonstandard 9600-bps modems because of the price, remember that you'll have to drop down to 2400 bps to talk to most on-line services.

Q. *I would like to set up an import-export business with clients in Japan. I have a thousand questions, especially concerning how to procure Japanese-language software and which computers are able to run it. Do you know where I can get help?*

ANTONY GALEA
FLUSHING, NEW YORK

A. Check out the Japan Round Table on General Electric's GEnie on-line service (for more information call 800/638-9636). There you can palaver with GEnie's many users in the Land of the Rising Sun about topics ranging from Tokyo pop to decorating Japan-style. You can even practice your Kanji—the Japanese character set. You can find the Japan RT under the General Interest category on the Basic Services menu, or under Symposiums on Global Issues on the standard menu. Head to Category 6, Personal Computing & Technology, for answers to all your Kanji tech questions. Post your concerns about doing business overseas in Category 9, Trade, Business & Politics. Since the Japan bulletin board is part of GEnie's Basic Service, you pay only $4.95 a month for unlimited access. That's less than a call to Henry Kissinger.

Mail your communications questions to Communications Q&A, PC World, *501 Second St. #600, San Francisco, CA 94107, or send them electronically to PC World Online, Communications Q&A; CompuServe, 75300,713; GEnie, JUDY.HEIM; MCI Mail, 312-7737; Internet, 3127737@mcimail.com; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Judy Heim is a contributing editor for PC World.

ANTHONY RUSSO

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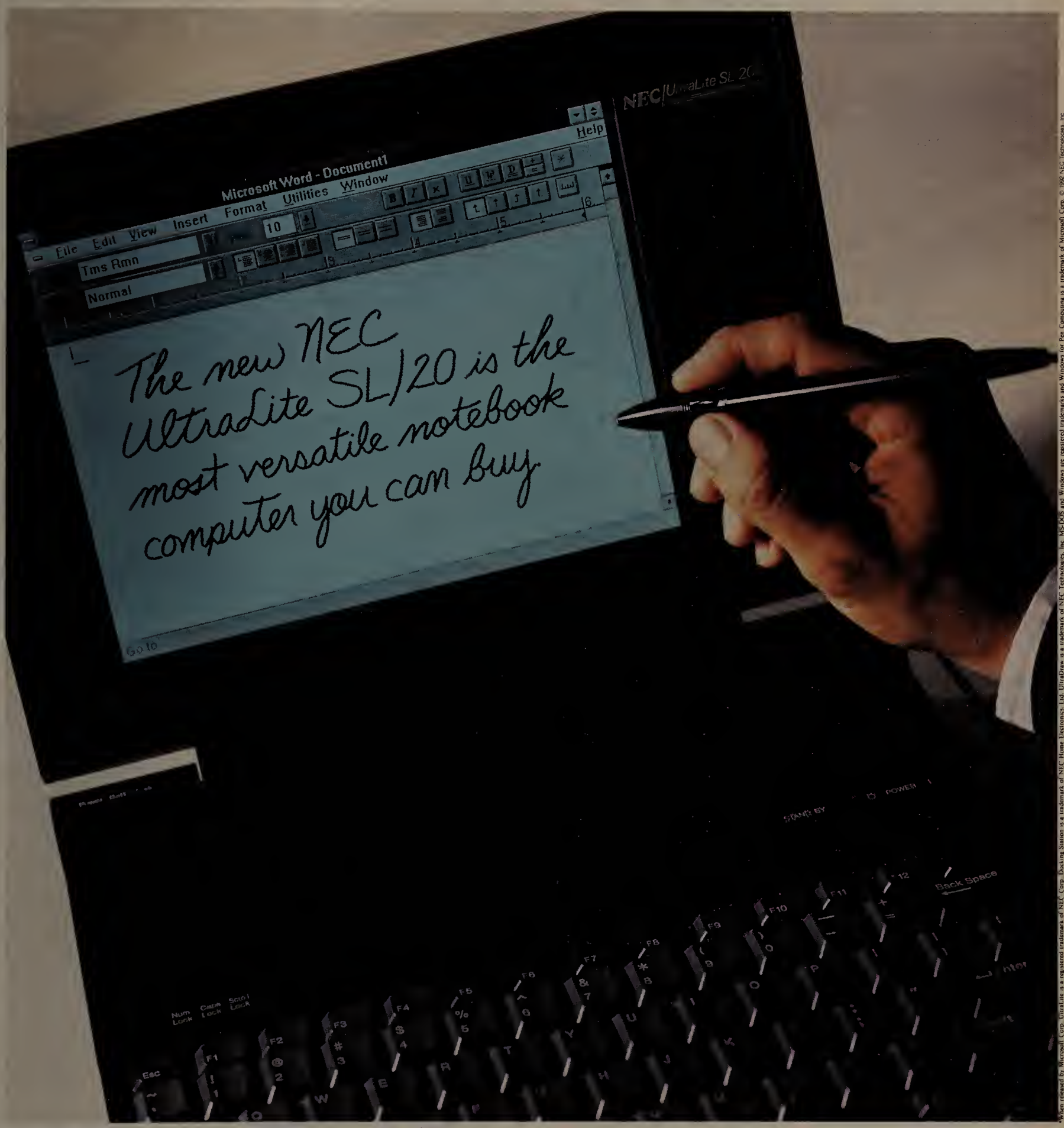

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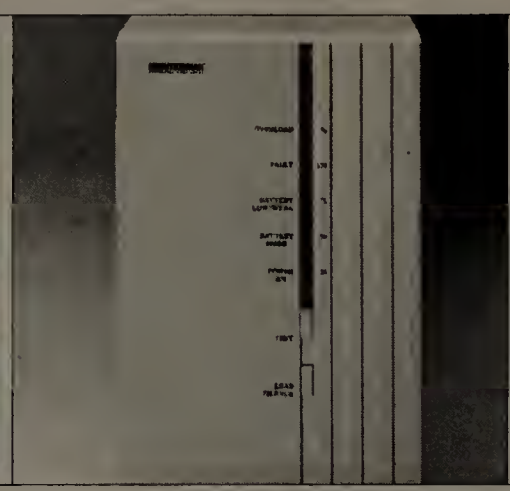

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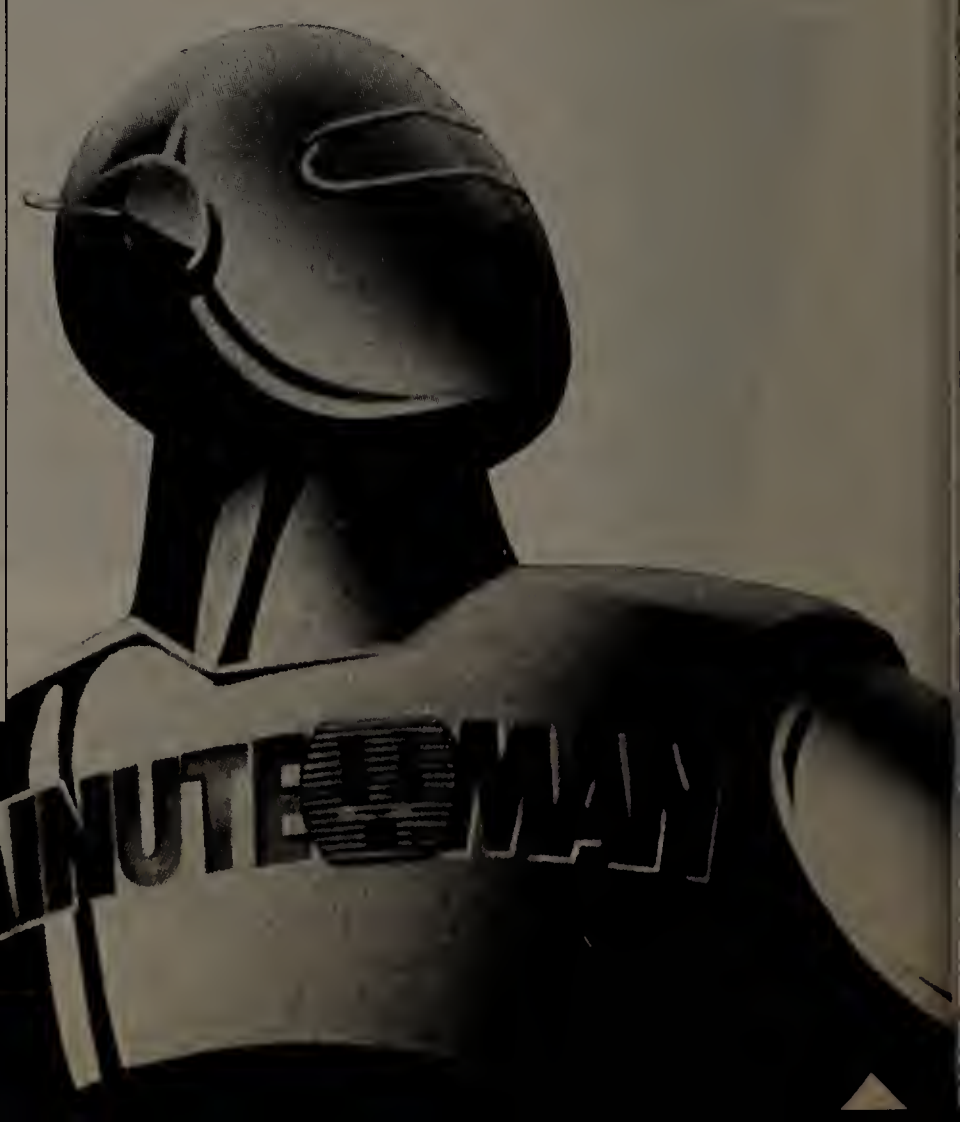

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WINDOWS WORKSHOP

BY BRIAN LIVINGSTON

Practical answers to your questions about Windows

Q. *Do you know of any way to get applications to open up automatically in a full-size window? Some of them do, and some don't. I can't see any rational pattern.*

EZRA GRIMES
BRIDGEPORT, CONNECTICUT

A. *Windows* has no way to force applications to run full size, or maximized, though some applications automatically reopen at the size their windows occupied when you last used them.

Otherwise, the simplest way to maximize an application's window is to launch it and then double-click anywhere in its title bar. This is much easier than trying to click the small Maximize button at the right-hand edge of the title bar. Double-clicking a maximized window's title bar restores that window to its previous size.

Of course, this doesn't affect the application's appearance at startup. If you don't have the patience for two clicks, check out "Windows Toolbox" (right) for a third-party utility that will let you start an application in the exact size you want it.

Q. *I like to have a number of applications—mostly programs such as Calendar or third-party utilities—load automatically when I start* Windows. *I just add the application file name, with path, to the 'load=' line in WIN.INI. But I've run out of room on that line, and* Windows *is refusing to auto-load anything beyond a certain number of applications. Can I extend the number of programs I can load?*

BRIANNA WILLIAMS
BETHESDA, MARYLAND

A. It's not a question of the number of applications, but the number of characters permitted on the 'load=' line: 127 after the equal sign. You can, however, make your entries on that line shorter.

For starters, if an application resides in a directory in your AUTOEXEC.BAT's PATH command, you don't have to include the application's drive and directory on the load= line. If the application's directory isn't in the PATH command, you can always add it.

Second, you can delete the file extensions EXE, COM, BAT, and PIF from the file names listed, since *Windows* automatically assumes that the file extension is one of those and acts accordingly.

Finally, you can upgrade to *Windows 3.1* and move icons for the applications in

Windows Toolbox

Some applications "remember" what size their windows were when you last used them, others don't. For forgetful applications, there's *RunProg*, an inexpensive way to start an application at any size you like. *RunProg*, which can start up to ten programs automatically, is $16. If you want to launch application windows at particular sizes but don't want to guess their width and height in pixels, you can get a companion program, *Pos*, which displays this information for any size window. It's available for $16. David Feinleib, 1430 Massachusetts Ave. #306-42, Cambridge, MA 02138; 617/484-5304.

ANTHONY RUSSO

question into Program Manager's StartUp window, which will load them whenever you launch *Windows*.

Q. *I'm trying to run a large DOS program under* Windows, *but I don't have quite enough memory, even though I'm using* QEMM-386. *If I could squeeze out just a bit more memory, I think the program would load. Is there a way to increase the available memory in a DOS session under* Windows? *I've already eliminated all memory-resident DOS programs.*

JOHN E. LITT
HEMPSTEAD, NEW YORK

A. If you run *Windows* in 386 enhanced mode and use a 386 memory manager, you may be losing memory in DOS sessions because of the way *Windows* handles upper memory blocks .

Upper memory blocks are chunks of memory addresses between 640K and 1MB. A 386 memory manager, such as Quarterdeck Office Systems' *QEMM-386,* can remap extended memory to these addresses. This memory may then be used to relocate DOS memory-resident programs in order to free up memory below 640K. Reserving all this memory for TSRs, though, can slightly reduce memory available to *Windows.*

In 386 enhanced mode, *Windows* establishes a "DOS translation buffer" of approximately 12K to 16K in an upper memory block. If a 386 memory manager is already managing all upper memory blocks, *Windows* thinks they are unavailable and locates the buffer area in the lower 640K instead, reducing conventional memory.

You can remove this translation buffer from your conventional memory by excluding a 16K chunk from your 386 memory manager. With *QEMM-386* you can include the 'X' parameter to keep the manager away from part of the D000 upper memory block, for example. In your CONFIG.SYS file, change your QEMM line to read: DEVICE=QEMM386.SYS RAM X=D000-D3FF.

If you're running DOS 4.0 or 5.0, type **MEM** during a DOS session under *Windows* both before and after the change to see how much memory you've gained.

If you're trying to load a text-mode application that doesn't require graphics mode, you can gain even more memory. *QEMM-386* includes a utility called Vidram that can extend your conventional memory up to 736K.

Q. *I'm about to upgrade to* Windows 3.1, *but I've been told that my version of* Hollywood, *a presentation program I like a lot, won't run under* Windows 3.1. *Can I run both versions of* Windows *on the same machine? Installing* 3.1 *seems to have wiped out my* Windows 3.0 *files.*

MONTGOMERY FORSTER
MILL VALLEY, CALIFORNIA

A. You could save yourself some problems by upgrading to the new version of *Hollywood,* which is *3.1* compatible. Otherwise, here's how to set up your PC so both versions of *Windows* can reside separately on your disk, allowing you to switch between them.

Before you install *Windows 3.1,* copy all *Windows 3.0* directories to a new set of directories titled something like \WINOLD. Do this by changing to your *Windows 3.0* directory at the DOS prompt and typing **XCOPY *.* C:\WINOLD /S.** The '/S' switch forces DOS to copy all subdirectories, such as *Windows'* SYSTEM subdirectory.

You may need to edit your old WIN.INI and SYSTEM.INI files manually to make *Windows 3.0* run in the new directory. Within those files, change any references to the old directory name to the new name instead.

Then install *Windows 3.1* into your old *Windows 3.0* directory, which will update all your executable files and device drivers. At this point, type **WIN** to start *Windows 3.1.*

To switch between *Windows 3.1* and *3.0,* make sure that \WINOLD isn't in your PATH. Make a batch file called WIN30.BAT that saves your old PATH, sets a new PATH containing \WINOLD instead of \WINDOWS, starts *Windows,* and after you exit *Windows,* resets your PATH to its original state:

```
SET OLDPATH=%PATH%
PATH C:\WINOLD;C:\DOS;...(and so on)
WIN
PATH %OLDPATH%
SET OLDPATH=
```

When you type WIN30, you'll invoke WIN30.BAT and *Windows 3.0* will load because its files are in a directory in your PATH. When you type WIN, the *Windows 3.1* files will run instead.

If you see the message 'Out of environment space' when you run WIN30-.BAT, increase the size of the DOS environment by adding the following line to your CONFIG.SYS file:

```
SHELL=C:\COMMAND.COM C:\/E:512 /P
```

The '/E:512' part of this line sets aside 512 bytes for the DOS environment, instead of the default 160. You must have DOS version 3.2 or later for this command to work.

If you use DOS 3.0 or 3.1, change '/E:512' to **/E:32** for the same effect.

Unfortunately, the two versions of *Windows* are a little touchy about each other. If you make a permanent swap file for either version of *Windows,* the other version finds it on your hard disk when starting up and complains that the file is corrupted. One version can't use the other version's swap file, but this won't cause any harm.

One more thing: Don't run *Windows 3.0* under *Windows 3.1.* The two programs get confused by each other's WIN.INI and other similar files, so always exit one before loading the other.

Mail your questions to Windows Workshop, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Windows Workshop; CompuServe, 74055,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Brian Livingston is president of Windows Consulting in Seattle and the author of Windows 3.1 Secrets *(IDG Books, San Mateo, California, 1992).*

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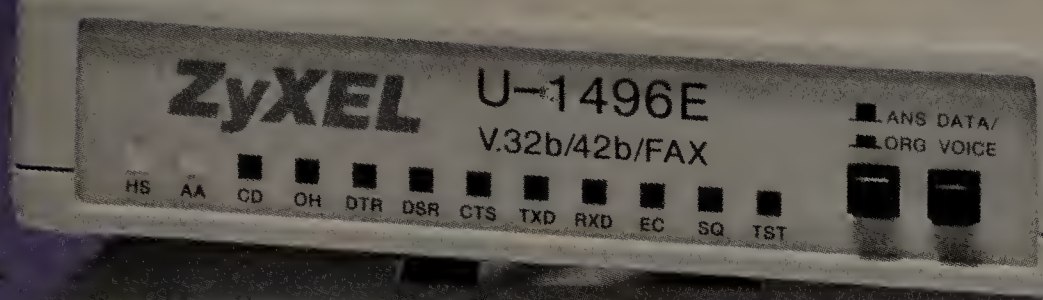

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Editor's Choice: ZyXEL U-1496E
German Edition, 4/92

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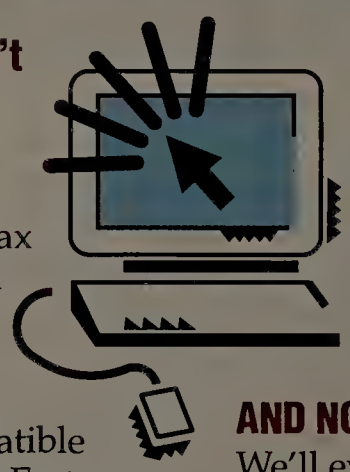

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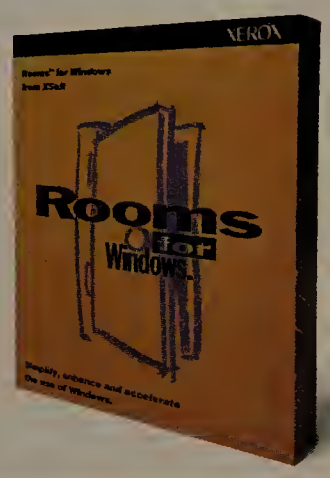

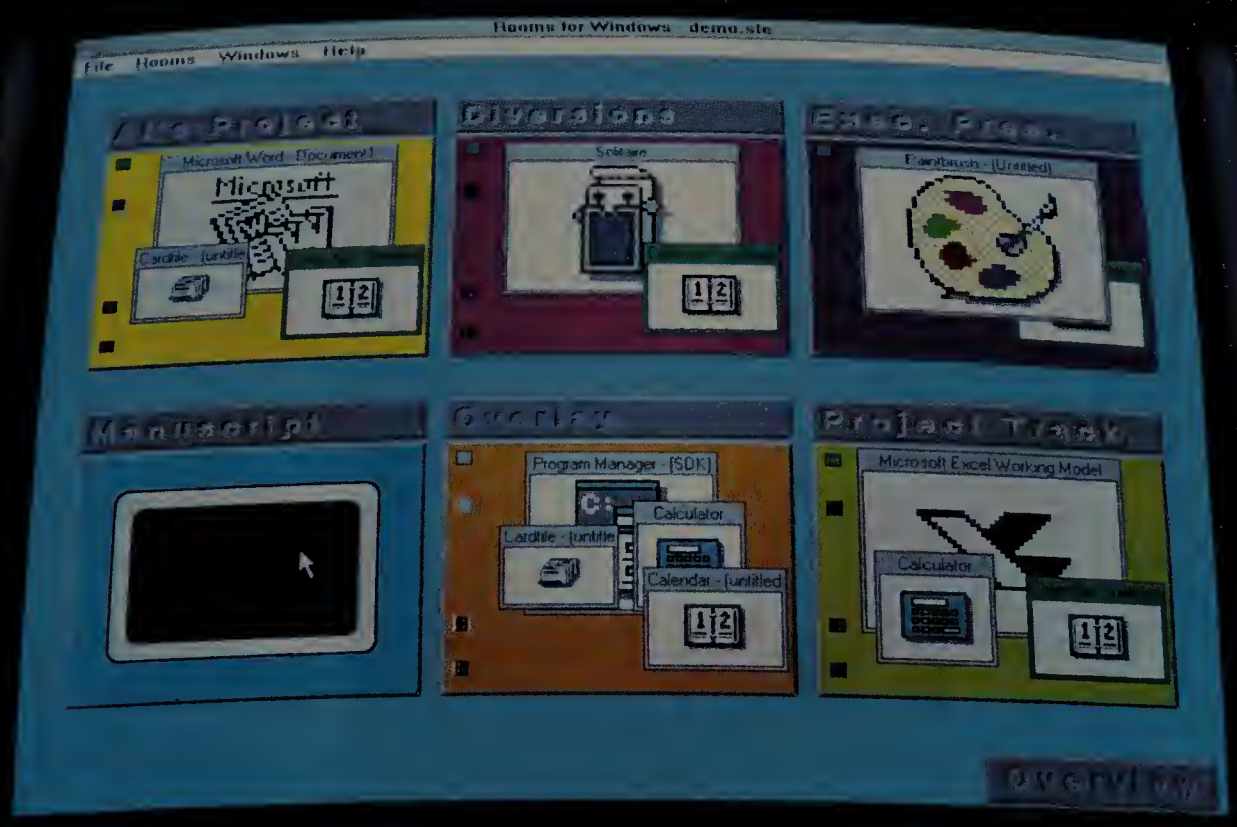

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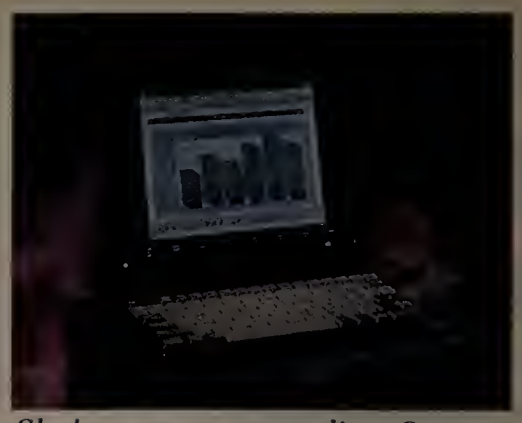

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USER GROUP TIPS

Helpful hints from members of the nation's user groups

Managing the 3.1 File Manager

The *Windows 3.1* File Manager is a big improvement over its predecessor, but some of its best tricks are still well hidden. Here are three of them:

Would you like File Manager to always load with the same directories in the same windows? Uncheck *Options • Save Settings on Exit* and arrange the windows and directories as you like. Hold down **<Shift>** and select *File • Exit.* You won't see anything happen now, but those window positions and contents will appear whenever you load File Manager.

Another trick: You can select all the files in a directory pane using a single keystroke: the slash key (/).

One more: If you double-click in the background of the drive bar at the top of a window, File Manager displays the Select Drive dialog box (or you can use the Disk • Select Drive command). Unlike what happens when you click a drive icon or press <Ctrl>-*driveletter* to select a drive, this dialog box shows you the volume name or network path of the drive—especially useful when you're connected to several network drives.

CARL SIECHERT
PASADENA IBM USERS GROUP

Frustrating Fonts in WordPerfect

When you edit a *WordPerfect* document, there's nothing worse than text extending beyond the right side of the screen. This often occurs when you use a proportional font that prints more than 80 characters per line. Here's a solution: Go to the top of your document by pressing **<Home><Home><Cursor Up>**, or, if you'v ıged fonts elsewhere in the document, go to the point directly after the last font change. Once there, press **<Ctrl>-<F8>F** to access the Base Font menu. Select *Courier 10cpi* or another 10-character-per-inch monospaced font. As you move the cursor through the document, the text will wrap within on-screen margins.

When you're ready to print, delete the font code you previously inserted. To find the code, press **<Shift>-<F2><Ctrl>-<F8>F<F2>**. This will bring your cursor to the space or character after the font; press **<Backspace>Y** to delete the code. You can create a macro to automate this: Press **<Ctrl>-<F10>**, give the macro a name or an <Alt>-*letter* designation and optional description, and then enter the preceding keystrokes. To stop recording, press **<Ctrl>-<F10>**.

MARY ROSS

ANNE EHRENSHAFT
EAST TENNESSEE PC USERS GROUP

Installing From B: as A:

Some of the people who write INSTALL programs must be brain dead. Why else would their software refuse to install from the B: drive? Don't they realize that if your A: drive is 5¼ inches and your B: drive is 3½, and a program ships on 3½-inch disks, you *can't* install it from your A: drive?

Thanks to DOS's ASSIGN and CALL commands, there's a solution: Create a batch file called MYINSTAL.BAT and place it in a directory that's referenced in AUTOEXEC.BAT's PATH command:

```
REM MYINSTAL.BAT
REM Installs software from drive B:
REM Example: MYINSTAL INSTALL
B:
ASSIGN A B
CALL %1 %2 %3 %4 %5 %6 %7 %8 %9
ASSIGN
```

To install a program from drive B:, just use the command **MYINSTAL** *install,* where *install* is the name of your new application's installation program or batch file. If the install program needs parameters, you can pass them along: **MYINSTALL** *install parameter1 parameter2,* and so on. The CALL command makes this technique work with installation batch files as well as programs.

BARRY KELLER
KERN INDEPENDENT PC USERS GROUP

Starting with the November issue, User Group Tips *will have a new format featuring tips from a single user group each month. Groups receive $200, 150 free copies of that month's issue, and the chance to attract new members. If your group would like to participate, write to* User Group Tips, PC World, *501 Second St. #600, San Francisco, CA 94107; or contact us electronically on PC World Online, User Group Tips; CompuServe, 74055,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax).*

ANTHONY RUSSO

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Which articles in *PC World* are valuable to you? Which aren't? Help us improve *PC World* by taking a few minutes to fill out the questionnaire below. Fax in your response and you'll have a chance to win the Best Buy Liberty Systems 115MO rewritable optical drive featured in this issue's review.

HOW IT WORKS: Please read or look through the magazine as you normally would. (If you normally look through it several times, do the same this time.) Then fill out the questionnaire below, indicating which articles you read and how valuable their content was to you. Please also take a moment to tell us what you would like to see in future issues.

HOW TO ENTER: Fax your completed questionnaire, along with your name, address, and phone number, to *PC World* at 415/267-1779. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, *PC World*, 501 Second St. #600, San Francisco, CA 94107. Send your survey in no later than September 15; we'll notify the winner by the end of September.

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HOW TO FILL OUT THE FORM: Photocopy this page and fill out the questionnaire using block pen. Fill the circles under the answers that apply to each article you read. Do NOT put an 'X' or a '✔' in the circles. First tell us whether you read the entire article or just some of it. If you didn't read it at all, leave the line blank. If you read the article, please rate its value to you on a scale from 1 (least valuable) to 5 (most valuable). WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES! One entry per person.

	Did you read it?		Value to you?				
	All	Some	Least 1	2	3	4	Most 5
Sample	◉	○	○	○	○	○	◉
In This Issue (page 13)	○	○	○	○	○	○	○
Letters (page 17)	○	○	○	○	○	○	○
Consumer Watch (page 27)	○	○	○	○	○	○	○
What Next? (page 37)	○	○	○	○	○	○	○
Top of the News (page 40)	○	○	○	○	○	○	○
Claris FileMaker for Windows (page 42)	○	○	○	○	○	○	○
DrawPerfect 2.0: Harvard Beware (page 44)	○	○	○	○	○	○	○
Iomega Tape Drives: A Backup First (page 45)	○	○	○	○	○	○	○
New Products (page 49)	○	○	○	○	○	○	○
Industry Outlook (page 89)	○	○	○	○	○	○	○
PC World Marketplace (page 98)	○	○	○	○	○	○	○
New 386 Notebooks (page 102)	○	○	○	○	○	○	○
Rewritable Optical Drives (page 136)	○	○	○	○	○	○	○
The Windows Shell Game (page 168)	○	○	○	○	○	○	○
Windows the Way You Want It (page 189)	○	○	○	○	○	○	○

	Did you read it?		Value to you?				
	All	Some	Least 1	2	3	4	Most 5
DOS Shells (page 203)	○	○	○	○	○	○	○
Stretching Your Upgrade Dollar (page 214)	○	○	○	○	○	○	○
Wireless LANs (page 224)	○	○	○	○	○	○	○
Portable Hard Drives (page 238)	○	○	○	○	○	○	○
PC World Adviser (page 251)	○	○	○	○	○	○	○
The Help Screen (page 257)	○	○	○	○	○	○	○
Spreadsheets (A..Z) (page 269)	○	○	○	○	○	○	○
Word Processing Clinic (page 281)	○	○	○	○	○	○	○
Data Basics (page 287)	○	○	○	○	○	○	○
Publishing & Presentations (page 292)	○	○	○	○	○	○	○
Communications Q&A (page 297)	○	○	○	○	○	○	○
Windows Workshop (page 301)	○	○	○	○	○	○	○
User Group Tips (page 307)	○	○	○	○	○	○	○
Star-Dot-Star (page 311)	○	○	○	○	○	○	○
Instant Reference Card: cc:Mail (page 313)	○	○	○	○	○	○	○
The Home Office (page 356)	○	○	○	○	○	○	○

What would you like to see covered in future issues?

- ○ Alternative CPUs
- ○ Processor upgrades
- ○ Scanners
- ○ CD ROM drives
- ○ Soundboards
- ○ Windows applications
- ○ DOS applications
- ○ OS/2
- ○ OS/2 applications
- ○ OCR software
- ○ CD ROM software
- ○ Desktop publishing
- ○ Other (specify) _____

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PC MAGAZINE
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August 1990
Service Diagnostics: The Kit

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Bill O'Brien, PC Magazine

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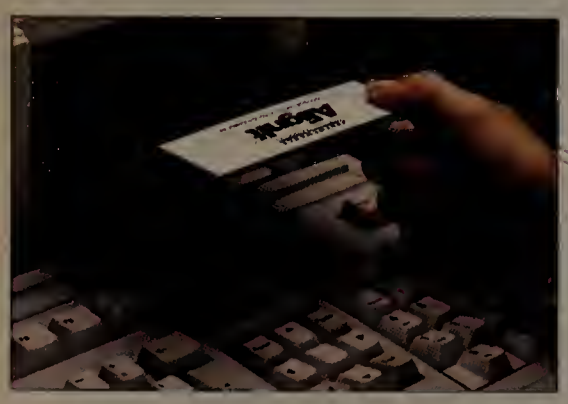

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STAR-DOT-STAR

EDITED BY BRETT GLASS

A global exchange of personal computer discoveries

Freeing DOS From Fragmentation

Unless you've watched the screen as your disk defragger goes to work, you might not have noticed a potential adverse effect of upgrading to DOS 5.0: When you install the DOS 5.0 upgrade, the new versions of the DOS system files, IO.SYS and MSDOS.SYS, are often stored in the physical middle of the hard disk instead of at the beginning as they were in earlier versions. (They still appear in the root directory, as before, but their physical locations on the disk platter may be different.)

Since the DOS system files come with their read-only, hidden, and system attributes turned on, no disk defragger will move them. This factor can prevent you from completely optimizing your hard disk.

But if you have *The Norton Utilities*, you can use its Disk Tools program (DISKTOOL.EXE) to move the new system files to the front of the disk. Boot your computer from a DOS 5.0 floppy, and run DISKTOOL. Select *Make a Disk Bootable* from the menu. When the program asks which disk you'd like to make bootable, select *C:*. This technique relocates the system files so they are the first entries on the hard disk.

NICHOLAS F. CHAMPION
COSTA MESA, CALIFORNIA

Editor's note: Unlike earlier versions, MS-DOS 5.0 doesn't require the system files to be the first two on the disk. The advantage of this change is that DOS doesn't need to push other files out of the way to make room for the new system files during installation; instead, it can simply store the system files wherever there's room. But as Mr. Champion correctly points out, placing these "unmovable" files in the middle of the disk can make life tough for a disk organizer. You won't see any change in your directory listings after using Mr. Champion's technique, and you'll have the same amount of free space on your disk as before, but your defragger won't have to work around two inconveniently placed but unmovable files.

Moving the system files to the beginning (that is, the outside edge) of your disk does more than facilitate defragging. It also makes your system more reliable (the outermost tracks of a hard disk are the least likely to fail) and helps it boot faster.

Norton's DISKTOOL is a foolproof way to accomplish this task. But if you don't own The Norton Utilities, *you may be able to convince your favorite defragger to move the files by removing their hidden, system, and read-only attributes. From the root directory, issue the commands* **ATTRIB -R -S -H IO.SYS** *and* **ATTRIB -R -S -H MSDOS.SYS** *to turn these attributes off (the file names may vary with some computer-specific packagings of MS-DOS). Then run the defragger, instructing it to put the files MSDOS.SYS and IO.SYS first. A few defraggers may still refuse to move the files, but most will oblige. Once the files are moved, you can restore their attributes with the commands* **ATTRIB +R +S +H IO.SYS** *and* **ATTRIB +R +S +H MSDOS.SYS**, *again issued from the root directory.*

Simple Screen Saver

We wrote a QBASIC screen-blanking program [see **LISTING 1**] that displays a user-supplied message and a digital clock, both of which randomly change color and screen position. With this program, you can tell other people in the office where you are with messages like 'out to lunch' or 'at a meeting; back by noon'. What's more, co-workers who know you have this program can leave you messages you can't possibly miss, like 'John Smith called. Phone 555-

```
5    CLS : W = 40: WIDTH W
10   INPUT "Message to display: "; R$
15   S = LEN(R$)
20   RANDOMIZE TIMER
25   ROWNUM = INT(RND * 20) + 1
30   COLNUM = INT(RND * (W - S)) + 1
35   CLS
37   IF INKEY$ <> "" THEN SYSTEM
40   COLOR (ROWNUM MOD 8) + 8
50   LOCATE ROWNUM, COLNUM
60   PRINT R$
70   L = 1
80   ROWNUM = INT(RND * 20) + 1
90   COLNUM = INT(RND * (W - 8)) + 1
100  COLOR (ROWNUM MOD 8) + 8
110  LOCATE ROWNUM, COLNUM
120  IF L >= 1000 THEN GOTO 25
130  PRINT TIME$;
140  L = L + 1
150  GOTO 110
```

LISTING 1: SAVER.BAS, which runs under DOS 5.0's QBASIC, lets you type in a message, then flashes the time of day and your message in random spots on a blank screen.

ANTHONY RUSSO

1234'. Finally, since the message and time move across an otherwise blank screen, this program protects your monitor from burnout.

To prepare the program, type it into an ASCII text file named SAVER.BAS. To run it, enter the command **QBASIC /RUN** *path***SAVER**, where *path* is the path to SAVER.BAS. After you've entered a message and the program starts displaying that message and the time on your screen, you can return to DOS by pressing any key.

The program should work well on any machine that's running DOS 5.0. You can delete the lines that set the color—40 and 100—if you don't happen to have a color monitor. The interval between screen changes can be controlled by changing the constant (we used 1000) in line 120. You can decrease the type size by changing W = 40 to W = 80 on line 5; in fact, some graphics adapters may require you to do this.

DAN AND MARY DEAN
FAIRBORN, OHIO

Editor's note: This program is simplicity itself. I made only a few modifications: I eliminated the dark colors (which at a distance don't show up well—or sometimes at all), made the positions of the date and message more random, made it easier to use 40-column mode, and allowed the user to exit with a single keystroke.

If the command line to call this program seems cumbersome, you can put it in a one-line batch file and put the batch file in a directory that's listed in your AUTOEXEC.BAT'S PATH command. One caveat: If someone leaves you a message with this program, make sure you jot it down before you

```
@ECHO OFF
REM Make sure the STRING isn't empty
IF "%STRING%"==""  GOTO error

REM Add a sentinel at the end
SET TEMPSTR=%STRING%■

REM Length is at least 1
SET LNGTH=1

REM DOS's batch language can't do math, so
REM increment counter using simple comparisons

:loop
REM Chop off the first character of the STRING
FOR %%Y IN (/%TEMPSTR%) DO SET TEMPSTR=%%Y
IF "%TEMPSTR%"=="■" GOTO done

IF  %LNGTH%==8  GOTO  error
IF  %LNGTH%==7  SET   LNGTH=8
IF  %LNGTH%==6  SET   LNGTH=7
IF  %LNGTH%==5  SET   LNGTH=6
IF  %LNGTH%==4  SET   LNGTH=5
IF  %LNGTH%==3  SET   LNGTH=4
IF  %LNGTH%==2  SET   LNGTH=3
IF  %LNGTH%==1  SET   LNGTH=2

GOTO loop
:error
SET LNGTH=?
:done
SET TEMPSTR=
```

LISTING 2: To demonstrate batch files' string-handling ability, this file, LENGTH.BAT, finds the length (up to 8 characters) of the environment variable STRING. To produce the block character (ASCII 254), hold down <Alt> while typing 254 on the numeric keypad.

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PC WORLD

Instant Reference Card #28

For use with PC World Instant Reference Card Portfolio

CC:MAIL FOR DOS

READING MAIL

Messages people send to you appear in your *Inbox*, which you can empty by deleting messages or filing them by subject into *folders*. All local users can read messages posted on any *bulletin board*.

Read messages in folder or on bulletin board	re**T**rieve messages•retrieve from bboard/ **F**older, select bulletin board or folder, select options
Find unread messages from Inbox and bulletin boards	re**T**rieve messages•search for **N**ew messages
Find message(s) by person	re**T**rieve messages•search by **P**erson, select person
Find message(s) with phrase in subject or item title	re**T**rieve messages•search by **K**eyword phrase, type phrase
Find message(s) by date	re**T**rieve messages•search by **C**alendar date, type on-or-after and on-or-before dates

NAVIGATING MESSAGE LISTS

Move to top of screen	**<Home>**
Move to bottom of screen	**<End>**
Scroll up/down half a screen	**<Page Up>/<Page Down>**
Go to top/bottom of list	**<Ctrl>-<Home>/<Ctrl>-<End>**

Fold Here

Read message in Inbox	**R**ead Inbox messages, highlight message, **<Enter>**; or re**T**rieve messages•retrieve from **I**nbox

Tip: You can display message lists in chronological order by adding the parameter FIFO to the command that launches cc:*Mail*.

RESPONDING TO MESSAGES

To act on a message after you read it, press **<Enter>** or **<F10>** for cc:*Mail*'s Action menu. All the actions below assume you are at this menu.

Reply to message	repl**Y** to message
Forward message	**F**orward, address, and send message
Store message in folder	**C**opy to folder/**M**ove to folder, select folder
Save message locally as ASCII file	**W**rite to ascii file, type file name
Save message locally in cc:*Mail* format	archi**V**e message, type file name
Delete message	**D**elete message, **Y**
Print message	**P**rint message
View attached item	display i**T**em
Read next message	display **N**ext message

Note: You can mark messages by pressing **<F5>**, then press **<Enter>** for a modified Action menu that will act on a group of files.

ADDRESSING MESSAGES AND EDITING TEXT

To send a message, select **P**repare new message. Address the message via the Address menu. Select e**N**d addressing, type a subject, press **<Enter>**, and type or import your message. Press **<F10>** and select **S**end message.

Editing options are available only while writing or reading messages. If you edit a message you've received, cc:*Mail* will offer reply and forwarding options after you have exited the editor.

Go to beginning/end of line	**<F3>/<F3><F3>**
Go to beginning of message	**<Ctrl>-<Home>**

ADDRESSING MESSAGES AND EDITING TEXT (continued)

Go to end of message	**<Ctrl>-<End>**
Insert line at cursor position	**<Alt>-<F3>**
Delete to end of line	**<Alt>-<F4>**
Change margins	**<F4>**, **<Left>** to desired left margin, **<F5>**, **<Right>** to desired right margin, **<F6><Enter>**
Change text colors	**<Alt>-<F1>**, select colors with cursor keys, **<Enter>**
Change entire message's colors	**<Alt>-<F2>**
Find text	**<F7>**, type phrase, **<Enter>**
Replace text	**<Alt>-<F7>**, type phrase, **<Enter>**, type new phrase, **<Enter>**
Select text block	Go to beginning of block, **<F5>**, go to end of black, **<F6>**
Move/copy block	Select block, move to destination, **<Alt>-<F5>/<Alt>-<F6>**
Print block	Select block, **<F8>**
Reformat block to default margins	Select block, place cursor in block, **<Alt>-<F8>**

Fold Here

Copy message/text block to DOS file	**<F9>**, type file name, **<Enter>**

ATTACHING EXTERNAL ITEMS

An *item* is an element you attach to a message, such as a file, a screen shot, or a graphic suitable for faxing. You can attach up to 20 items to a message. When you are finished, select e**N**d attaching.

Insert text file into message	**<Alt>-<F9>**, select file
Attach file to completed message	attach copy of DOS **F**ile, type path and file name
Draw graphic and attach it to completed message	attach new **I**tems•attach **G**raphics item, draw picture, **<F10>**
Attach bulletin board/folder messages to completed message	**F**older, type folder name, type message number, **<Enter>**

CUSTOMIZING CC:MAIL

You can organize your own mail by creating private mailing lists and folders. Public mailing lists and folders are created by your cc:*Mail* network administrator and begin with #. To customize your mailboxes, go to the main menu and select **M**anage mailbox.

Create private mailing list	manage **M**ailing lists, type new list name, select user names
Create private folders	manage **F**olders, type new folder name
Add names to private list	manage **M**ailing lists, select list, **<Enter>**, **A**dd names to mailing list, select names
Change private list/folder title	manage **M**ailing lists/manage **F**olders, select list/folder, **<Enter>**, **C**hange mailing list/folder title, type new name
Delete private list(s)/folder(s)	manage **M**ailing lists/manage **F**olders, select list/folder, **<Enter>**, **D**elete mailing list/folder, **Y**
View list of users	**V**iew mail directory

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CC:MAIL FOR WINDOWS

USING SMARTICONS

The SmartIcon tool bar gives you easy, one-click access to many *cc:Mail* tools. Click the right mouse button on any SmartIcon to show the keyboard equivalent on the title bar. You can add additional SmartIcons to the bar.

Button	Task	Keyboard equivalent
	Prepare message	**<Alt>-P**
	View folders	**<Alt>-O**
	View Inbox	**<Alt>-I**
	View bulletin board	**<Alt>-B**
	View list of users	**<Alt>-D**
	View mail list	**<Alt>-L**
	Attach items	**<Alt>-C**
	Send	**<Alt>-N**
	Reply to message	**<Alt>-Y**
	Forward message	**<Alt>-R**
	Store message	**<Alt>-T**
	Delete message	**<Delete>**; **<Alt>-<Delete>** when viewing message
	Read previous message	**<Alt>-<Left>**
	Read next message	**<Alt>-<Right>**

Note: You must display a message to use SmartIcons to send, reply, forward, attach, and go to the next or previous message.

READING AND RESPONDING TO MESSAGES

You can list messages in your Inbox, folders, or bulletin boards by picking options from the **S**elect menu or by pressing **<Alt>-I**, **<Alt>-O**, or **<Alt>-B**, respectively.

Read selected message	**<Enter>** or double-click
Find messages from person, by subject title or with phrase	**E**dit•**S**earch, select search category, type text string, Find
Store message in folder	**F**older, select folder or enter folder name
Save message locally as ASCII file	**F**ile•**S**ave/Save **A**s
Save message locally in *cc:Mail* format	**<Alt>-T**, **A**rchive, select file or type file name
Copy file item to local disk	**F**ile•**S**ave/Save **A**s
View next open mailbox	**<Ctrl>-<Tab>**

PREPARING MESSAGES

To send a message, press **<Alt>-P** or the *Prepare message* SmartIcon. Address the message, from the Address Message dialog box, to as many people, bulletin boards, or mailing lists as you wish. When finished addressing, select Done. Type a subject and, if desired, check the Receipt box or set a Priority. Type your message or paste it from the Clipboard. To send your message, press **<Alt>-N**.

You can attach existing files, create file-like attachments, or copy text into a message. The commands below work only while you are preparing a message. You can attach up to 20 items to a message.

Insert text from other application	In other application, copy text to Clipboard; in *cc:Mail* message, **<Shift>-<Insert>**
Attach file to message	**<Alt>-C**, select directory and file
Create and attach text object with Notepad	**<Alt>-C<Alt>-E**, edit Notepad "file," exit Notepad, confirm save, type prefix, OK
Create and attach graphic object with Paintbrush	**<Alt>-C<Alt>-G**, edit graphic, exit Paintbrush, confirm save, type prefix, OK
View selected item	**M**essage•**V**iew item
Load attached item into appropriate application	Highlight item, **<Enter>**; or double-click on object icon

Fold Here

Fold Here

CUSTOMIZING CC:MAIL

Move SmartIcons to another screen location	**F**ile•Opti**o**ns•Smart**I**cons
Add SmartIcons to bar	**F**ile•Opti**o**ns•Smart**I**cons•**C**ustomize
Change start-up and window defaults	**F**ile•Opti**o**ns•**D**isplay
Choose command(s) for *cc:Mail* to request confirmation for	**F**ile•Opti**o**ns•**C**onfirmation
Change message preparation defaults	**F**ile•Opti**o**ns•**M**essage
Tell *cc:Mail* how to notify you of new messages	**F**ile•Opti**o**ns•**N**otify
Change sort order of messages	**F**ile•Opti**o**ns•**L**ists
Change default column width in message list	Place pointer between two title bar sections, drag cross-hair icon horizontally
Change font	**F**ile•Opti**o**ns•**F**onts
Turn ruler on/off	**<Ctrl>-R**
Change current paragraph's margins/tabs	**<Ctrl>-T**, set margins/tabs, OK; if ruler is on, drag margin markers
Set default margins/tabs	**<Ctrl>-T**, set margins/tabs, **S**ave, OK
Apply default margins/tabs to current paragraph	**<Ctrl>-D**
Change color of selected message text	**<Ctrl>-H** or click right mouse button inside text
Tile mailboxes	**<Shift>-<F4>**
Cascade mailboxes	**<Shift>-<F5>**
Change password	**F**ile•Opti**o**ns•Change **P**assword, type old password, type new one, OK, type new one again

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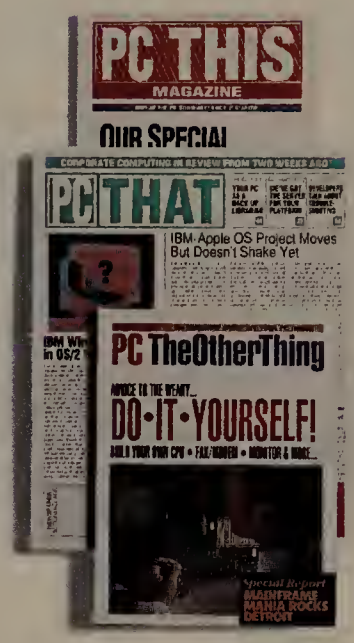

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press a key. Otherwise, it will be gone for good when you return to DOS.

Fantastic FOR

I've discovered a way to manipulate text strings in batch files, thanks to a little-known aspect of the DOS FOR command: If a string in the parenthesized portion of FOR's parameters is preceded by a slash, DOS splits it into two strings: the first character, and the remainder of the string. To see this trick in action, enter the command **FOR %Y IN (/1234) DO ECHO %Y** at the DOS prompt. DOS first echoes '1', then '234'.

Enclosed are two batch files that show how you can use this hidden talent. The first, LENGTH.BAT [see **LISTING 2**], returns—as the environment variable LNGTH—the length of a word stored in another variable called STRING. The second, OFFLEFT.BAT [see **LISTING 3**], deletes the first N characters of STRING, where N and STRING are both environment variables. Use SET to create STRING and N before running these batch files and to see the results.

DAVID GRACZYK
AMHERST, NEW YORK

Editor's note: I never knew DOS's batch language had even rudimentary string-handling capabilities, but this technique opens the door to all sorts of ingenious tricks. For example, you could create a menu that allows you to select several options—each represented by a letter or digit—at one time by typing them in sequence on the command line.

Instant Windows

You could buy an extra-cost utility to bring up commonly used documents and applications when you start up *Windows*, but here's a way to do it that won't cost you a cent.

Using SYSEDIT or another text editor, open your WIN.INI file. At the top of the file is a line that begins 'LOAD='. On that line, type the names of the files or programs you want loaded at start-up, each separated by a single space.

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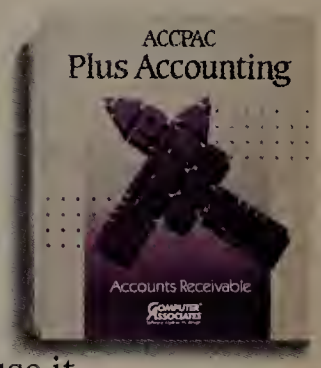

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```
@ECHO OFF
IF %STRING%.==. GOTO error
IF %N%.==. GOTO error

IF %N%==1 GOTO LOOP
IF %N%==2 GOTO LOOP
IF %N%==3 GOTO LOOP
IF %N%==4 GOTO LOOP
IF %N%==5 GOTO LOOP
IF %N%==6 GOTO LOOP
IF %N%==7 GOTO LOOP
GOTO error

:loop
FOR %%Y IN (/%STRING%) DO SET STRING=%%Y

IF  %N%==1     SET N=
IF  %N%.==2.   SET N=1
IF  %N%.==3.   SET N=2
IF  %N%.==4.   SET N=3
IF  %N%.==5.   SET N=4
IF  %N%.==6.   SET N=5
IF  %N%.==7.   SET N=6

IF  NOT %N%.==. GOTO loop
GOTO done
:error
ECHO Error
:done
```

LISTING 3: This batch file, OFFLEFT.BAT, deletes the N leftmost characters from a STRING variable.

Let's say you want to load an *Excel* spreadsheet, a *Microsoft Word* table of addresses, and a *Visual Basic* program you're writing called MYCODE.MAK. Your load= line would look like this: LOAD=C:\EXCEL\LIBRARY-\BUDGET93.XLS C:\WORD\TA-BLES\ADDRESS.DOC C:\VB-\CODE\MYCODE.MAK

Windows will find the file and use its "association" function (which recognizes data files for different applications by looking at their extensions) to load it into the proper program. Any data file you list here must be associated with an application for this scheme to work.

STEVEN D. DAY
GLOUCESTER, MASSACHUSETTS

Editor's note: I've always known about the load= line in WIN.INI, but Mr. Day's tip includes a capability that was new to me: You can use the line to load data files as well as programs. If you're using Windows 3.1, *you can also place a data file in the Program Manager's StartUp window and achieve the same result. This tip can save you lots of time if you use certain documents whenever you run* Windows.

A few words about associations are in order: Many applications set up their associations automatically, but you can add those associations manually by editing the [Extensions] section of your WIN.INI file. For example, the line 'doc=c:\winword-\winword.exe ^.doc' will associate any file with the extension DOC with Word for Windows. *If you also add the line 'ltr=c:\winword\winword.exe ^.ltr', files with an LTR extension as well as DOC files will load* WinWord. *On the other hand, if you find that* Windows *is trying to load a file into the wrong application or can't find an application to open the file, you may need to edit this section of WIN.INI to set* Windows *straight.*

Don't Recurse Into Windows

Here's a way to avoid invoking *Windows 3.0* again from within a *Windows* DOS session. First, rename C:\WINDOWS\WIN.COM to WINDOWS.COM. Then copy the batch file shown here [see **LISTING 4**] into an ASCII text file called WIN.BAT in your WINDOWS directory (if your WINDOWS directory isn't C:\WINDOWS, you'll need to alter the batch file appropriately). Typing **WIN** at the DOS prompt will thereafter call the batch file instead of loading *Windows* directly.

```
@ECHO OFF
IF EXIST C:\WINDOWS\WIN?86.SWP EXIT
WINDOWS.COM
ECHO ON
```

LISTING 4: Once you've turned WIN.COM into WINDOWS.COM, WIN.BAT makes sure you never load Windows 3.0 inside itself.

The batch file works by looking for a swap file, WIN?86.SWP (it's WIN-386.SWP in 386-enhanced mode and WIN286.SWP in standard mode), that's present only when *Windows* is running. If you run WIN when *Windows* isn't running, WIN.BAT starts it for you via WINDOWS.COM. But if you run it in a *Windows* DOS session, the batch file will execute an EXIT command and return you to the desktop.

WALTER J. ORLIK
DELRAY BEACH, FLORIDA

Editor's note: This batch file is a good way to keep from invoking Windows 3.0 *twice (*Windows 3.1 *won't let you accidentally load it inside itself). Our December 1991 column featured another solution to this problem: a program that returns an ERRORLEVEL of 1 when* Windows *is running. Both of these techniques can be used to keep from turning* Windows 3.0 *into a memory-eating hall of mirrors.*

Have a macro, batch file, short program, or general tip you're proud of? Mail your tips to Star-Dot-Star, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Star-Dot-Star; CompuServe, 74055,412; MCI Mail, PC World Editorial; Internet, rogue@well.sf.ca.us; or 415/442-1891 (fax).* PC World *pays $25 to $200 for each tip used. Sorry, we cannot acknowledge unpublished materials.*

Brett Glass is a contributing editor for PC World *and a weekly columnist for* InfoWorld.

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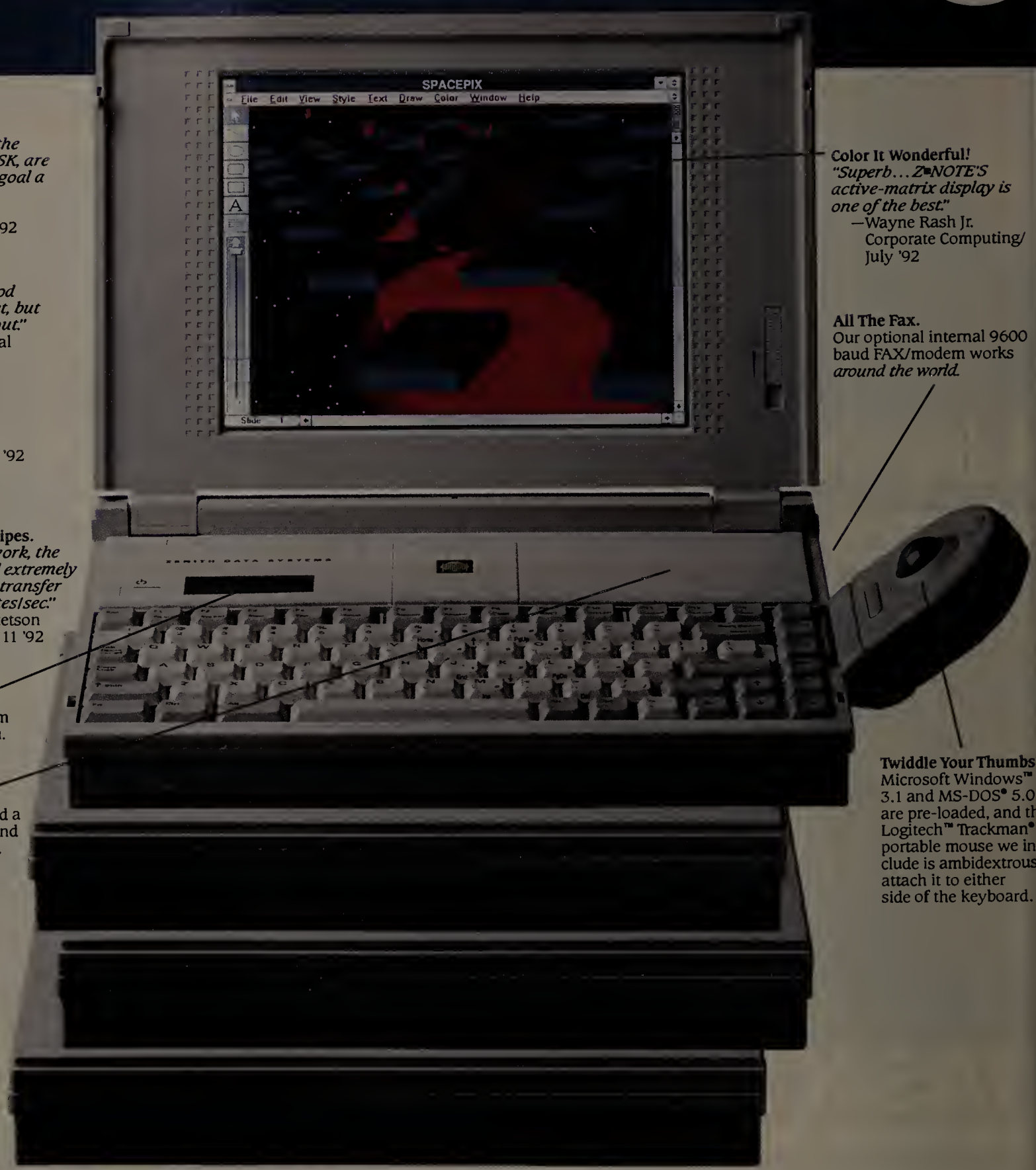

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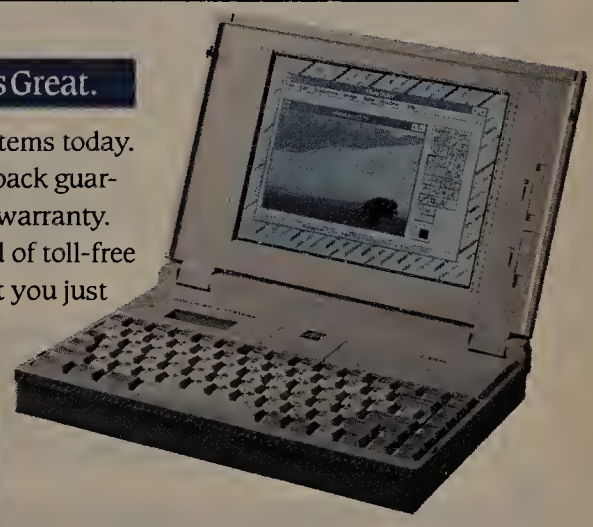

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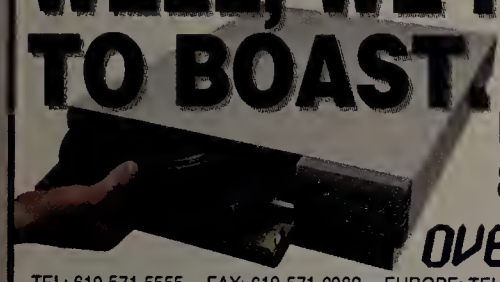

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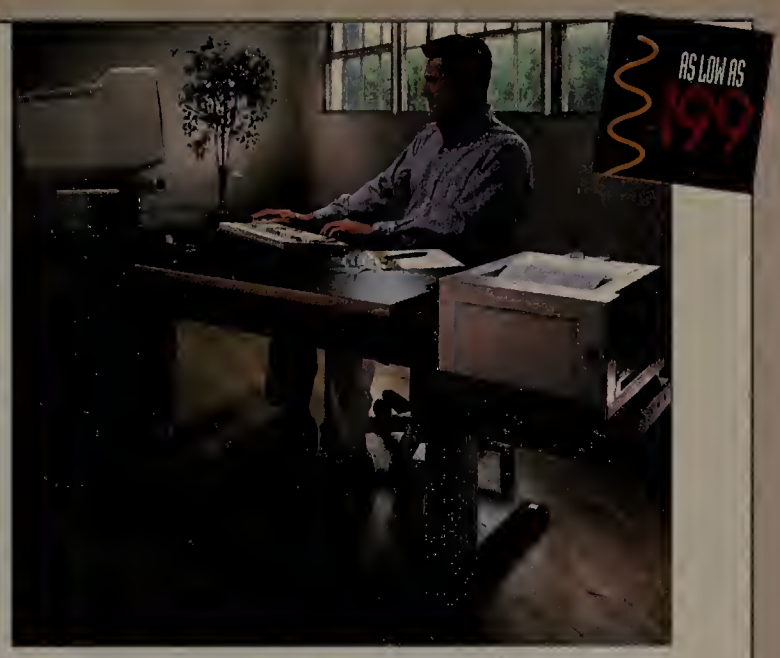

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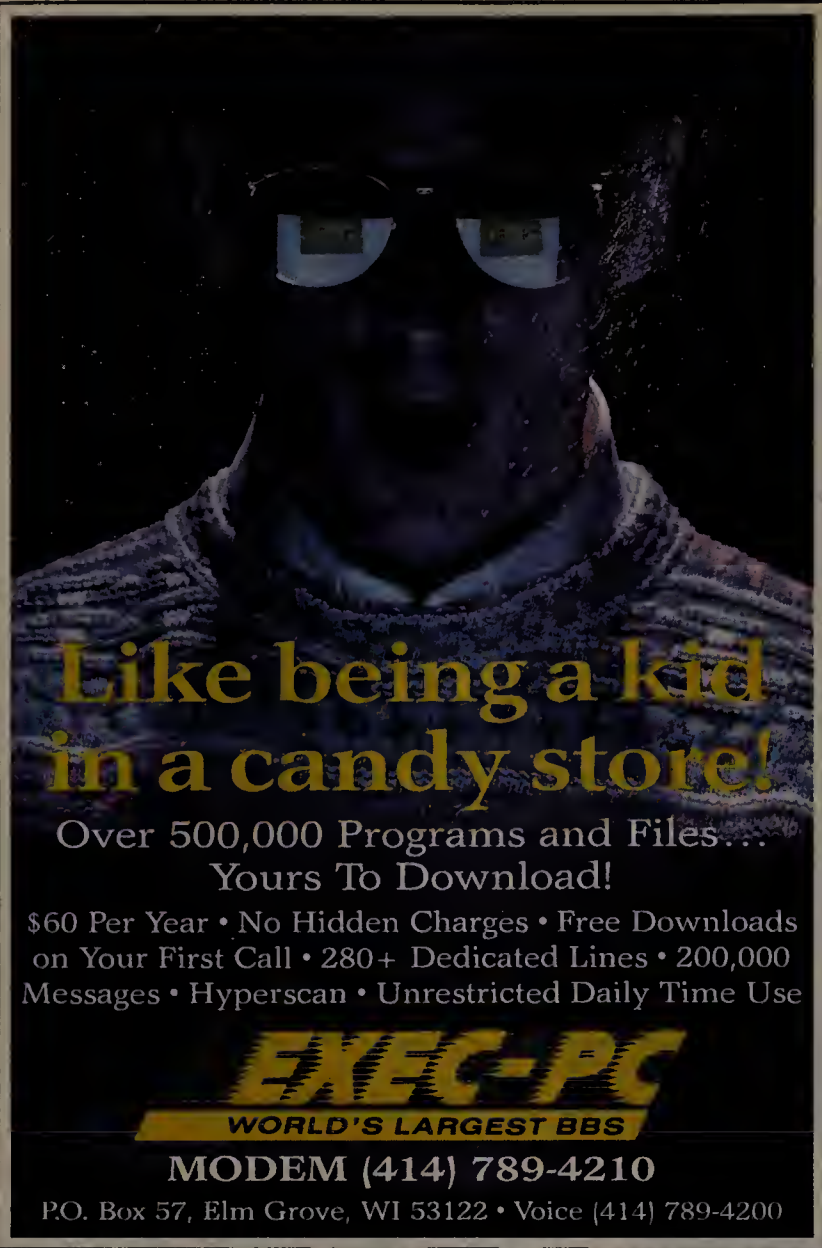

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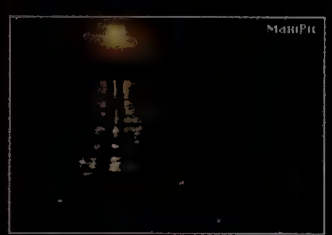
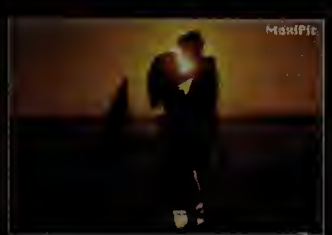

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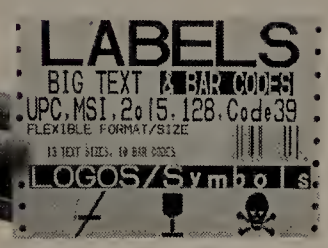

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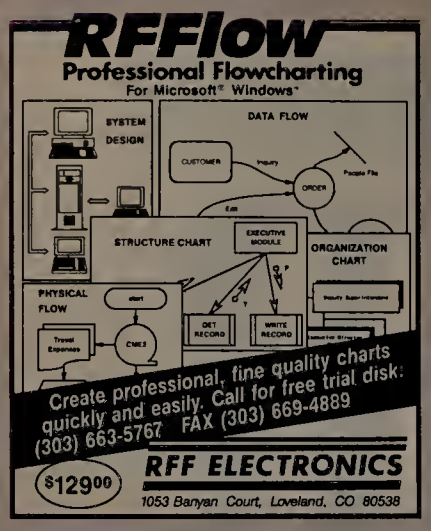

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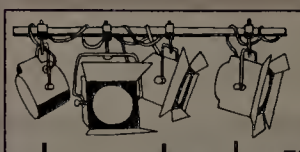

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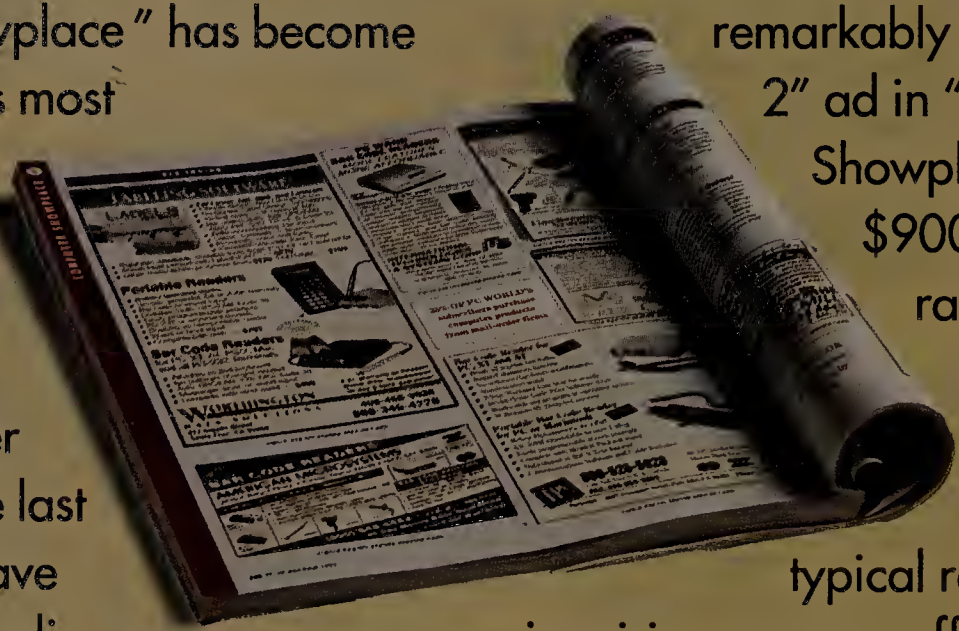

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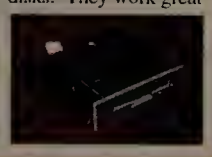

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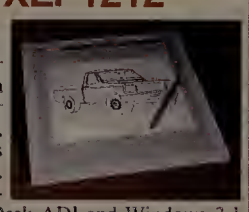

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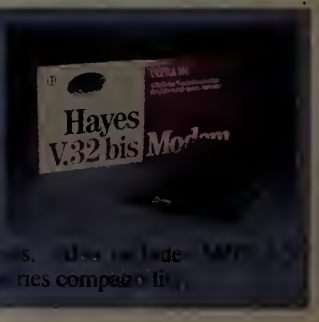

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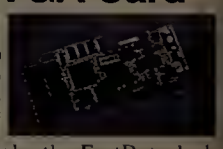

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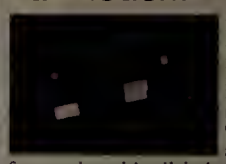

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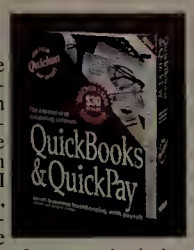

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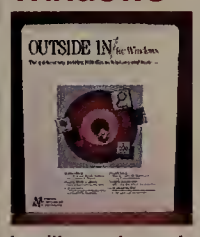

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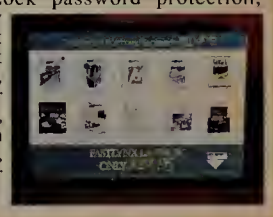

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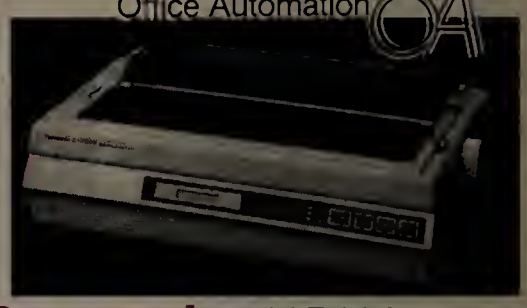

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- ☐ **TOTAL RECALL** v2.0 (3068) Menu-driven system to help you memorize words, facts, phrases, names, dates, acronyms, etc.

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- ☐ **SEABATTLE** v2.54 (4071) Very realistic simulation of World War II Naval Combat. REQ. CGA
- ☐ **NCR GOLF** (4171) Championship PGA course, 1969. Green slopes, water, wind, sand and other hazards. REQ. CGA

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- ☐ FAMILY (5019)
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- ☐ **GRAPHIC WORKSHOP** v6.1 (5048/2-DISKS) Convert graphic files from one format to another. 256 colors, view, PostScript printer, color to B&W clip art. REQ. CGA/VGA
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- ☐ **BROTHERS KEEPER** v5.0 (6019/2-DISKS) A genealogy program that records dates, names, & other information. Prints descendant charts, & more.
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WINDOWS 3.0

- ☐ **SCREEN SAVER FOR WINDOWS** (7005) Blank the screen after an interval of no keyboard activity. Patterns, & blanking.
- ☐ **WALLPAPER #3** (7014/2-DISKS) Customize your Windows 3.0 desktop with one of 35 color pictures.
- ☐ **GAMES FOR WINDOWS #2** (7028) AForce, Backg, Chk-W3, SpaceW, Winches, Winpokr, Wormwar, Yacht, YTZ.
- ☐ **GAMES FOR WINDOWS #3** (7035) Arachnid, Blackjack, Blackout, Brick, Calc. Solitaire, Concentration, Mile Bones, Meku, TseTse, Winpente.
- ☐ **GAMES FOR WINDOWS #4** (7038) Attaxx, Barteyes III, Triplets, Neko, Trails, Take One, Slot Machine, MemoryTiles, BlockBreaker, Roulette.
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- ☐ **WHISKERS** v2.6a (7095) Enables the right mouse button to act as the Enter key.
- ☐ **WINPOST** v3.1a (7096) Allows up to 32 on-screen Post-It notes to be active at once. Contents & position are saved.

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- ☐ **AS EASY AS** v5.01b (1072) A full-featured clone of Lotus 123. One of the top 10 Shareware Programs.
- ☐ **PC-CALC** + v2.0 (1075/3-DISKS) An effective full-featured alternative to the expensive commercial spreadsheets.

UTILITIES

- ☐ **VIRUSCAN** v8.6V93 (8026/2-DISKS) Checks your system for all known viruses.
- ☐ **ZIP UTILITIES** (8012/3-DISKS) Programs to compress & decompress files. PKZIP v1.1, SHEZ v6.2, PKLITE v1.12, & more.
- ☐ **AUTOMENU** v4.7 (8015) One of the best DOS menu systems available. Easy, fast, flexible. Automatically submit commands.
- ☐ **SCREEN SAVERS FOR DOS** (8115/2-DISKS) Blanks the screen after an interval of no keyboard activity. Patterns/blank.
- ☐ **POINT & SHOOT BACKUP & RESTORE** v2.1 (8027) Easy to use program to backup your hard disk. More reliable & quicker than DOS backup system.
- ☐ **TELIX** v3.15 (8029/2-DISKS) The best telecom program avalilable. 300-115,000 BPS, scripts, doorway, macros, ASCII - ZModem, background, modem config.

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- ☐ **PC-WRITE** v3.04 (9021/3-DISKS) Leading wordprocessor for IBM PC's. Los Angeles Times uses it exclusively.
- ☐ **WORD PERFECT 5.1 LEARNING SYSTEM** v1.0 (9036/3-DISKS) Professionally done tutorial for beginning WP 5.1 users. REQ. 2FD or HD
- ☐ **INTEXT MULTILINGUAL WP** v1.2 (9043/3-DISKS) Word processing in English & a second language. Includes all 26 languages. REQ. 512K
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DNQ

THE HOME OFFICE

BY STEVE BASS

The practical guide to home/office computing

Look, I've seen plenty of multimedia demos at my user group meetings and haven't been sold. I upgraded with an ATI VGAStereo-F/X to get sound along with high-resolution VGA—so now I can listen to digitized belching and watch the dog tilt his head when the MEOW.WAV blasts through the speakers. But even *that* didn't hook me on multimedia.

Two weeks with Acer's new Acros 380—the first PC to give me every business machine I need at home in one piece of hardware—changed my mind.

The Acros's basic specs sound like every other low-end multimedia system's: a 25-MHz 386SX processor with 4MB of RAM (upgradable to 16MB), a 130MB 15ms IDE hard disk, an internal CD ROM drive with a 150-kbps transfer rate, a stereo sound card with MIDI interface, a super-VGA adapter, a 14-inch color monitor, and a 3½-inch floppy. You also get a one-year on-site warranty and toll-free support. Not a bad deal, and don't be surprised if you see it on the street for $1700 by the end of the year.

The Acros stands out as a useful business machine because Acer has included a 9600/4800-bps fax, a 2400-bps modem, and a digital answering machine. The Acros has jacks for a microphone and headphones, and you can use the built-in condenser microphone to answer the phone and record outgoing messages. Depending on where you buy the computer, it may come with a pair of Acoustic Research speakers. You'll never have to pick the receiver up off the hook again.

More important for productivity, Acer has included multimedia software that turns the Acros into a communications workstation. If you're in an application when a call comes in, a dialog box asks if you want to answer the phone or have the machine take a message. The Acros is smart enough to distinguish between voice, data, and fax calls and offer you appropriate options.

You say you're frequently away from your home office? Not a problem. The machine turns itself on to answer any kind of call within four rings. Because

TERRY ALLEN

Acer uses logical rather than mechanical switches—they call it StartSmart technology—the machine's ready to work anytime. Plus, Acer's timer lets you send faxes in the middle of the night, when long-distance rates are lowest.

Once you've proved to the IRS that the Acros is a business machine, fire up the AM/FM digital stereo tuner or play jazz on the CD while you're working. Or really go to town and add *Sherlock Holmes, Consulting Detective,* an interactive CD ROM game. My wife, a presentation junkie, grabbed hold of *Mediasource,* a CD collection of image and audio libraries.

To make life easier, Acer put the volume control where it really belongs—on the front panel of the computer. Unfortunately, the power and reset switches are too close to the volume control and look just like it. But even if you accidentally power down, Acer's SaveSmart software creates a backup of your session so you can power up and get back to work.

The Acros doesn't ship with *Windows 3.1,* so you can't voice annotate OLE-compatible apps. Instead, it has a proprietary plug-and-play interface running under *Windows 3.0 Multimedia Extensions.* (A *3.1* upgrade is in the works.) The Acros comes with *Prodigy,* Delrina's *WinFax Pro,* and Microsoft's *Bookshelf for Windows* and *Works for Windows, Multimedia Edition.*

Getting the Acros from my editors wasn't easy. But now that I have it, the question is, how do I get it away from my wife?

Contributing Editor Steve Bass is a family therapist and president of Pasadena IBM Users Group. He can be reached on PC World Online (see page 8 for more information).

ANTHONY RUSSO

WHERE TO BUY

Acros 380 $2399; Acer America; 800/733-2237
Reader service no. 660

Mediasource $395; Applied Optical Media; 800/321-7259
Reader service no. 661

Sherlock Holmes, Consulting Detective $69.95; Icom Simulations; 800/877-4266, 708/520-4440
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